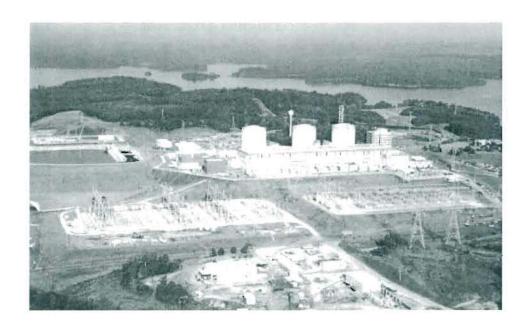
# DECOMMISSIONING COST ANALYSIS

# for the

# OCONEE NUCLEAR STATION



preparent 101!

# **Duke Energy Corporation**

jurcipolica by

TLG Services, Inc.
Bridgewater, Comnecticut

December 2008

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# TABLE OF CONTENTS

$\underline{\mathbf{SE}}$	CTIC	N		PAGE
	EXI	ECUTI	VE SUMMARY	viii-xviii
1.	INT	'RODU	JCTION	1-1
	1.1	Objec	ctives of Study	1-1
	1.2	Site I	Description	1-1
	1.3	Regu	latory Guidance	1-2
		1.3.1	Nuclear Waste Policy Act	1-4
		1.3.2		
		1.3.3	Radiological Criteria for License Termination	1-7
2.	DE	COMM	IISSIONING ALTERNATIVES	2-1
	2.1	DEC	ON	2-1
		2.1.1	Period 1 - Preparations	2-2
		2.1.2		
		2.1.3		
		2.1.4	ISFSI Operations and Decommissioning	
	2.2		STOR	
		2.2.1	Period 1 - Preparations	
		2.2.2	Period 2 - Dormancy	
		2.2.3	Periods 3 and 4 - Delayed Decommissioning	
		2.2.4	Period 5 - Site Restoration	2-12
3.	COS	ST EST	ΓΙΜΑΤΕ	3-1
	3.1		s of Estimate	
	3.2		odology	
	3.3		ct of Decommissioning Multiple Reactor Units	
	3.4	Finar	ncial Components of the Cost Model	
		3.4.1	Contingency	
			Financial Risk	
	3.5		Specific Considerations	
			Spent Fuel Management	
		3.5.2	Reactor Vessel and Internal Components	
		3.5.3	Primary System Components	
		3.5.4	Retired Components	
		3.5.5	Main Turbine and Condenser	
		3.5.6	Transportation Methods	
		3.5.7	Low-Level Radioactive Waste Disposal	
		3.5.8	Site Conditions Following Decommissioning	3-15

# TABLE OF CONTENTS

(continued)

$\underline{\mathbf{SEC}}$	TIO	<u>ON</u>	PAGE
	3.6	Assumptions  3.6.1 Estimating Basis  3.6.2 Labor Costs  3.6.3 Design Conditions  3.6.4 General  Cost Estimate Summary	3-16 3-16 3-17 3-18
4.	SCF 4.1 4.2	HEDULE ESTIMATE Schedule Estimate Assumptions Project Schedule	4-1
5.	RAI	DIOACTIVE WASTES	5-1
6.	RES	SULTS	6-1
7.	REI	FERENCES	7-1
		TABLES	
3.1 3.2 3.2a 3.2b 3.2c 3.3 3.3a 3.3b 3.3c 3.4 3.4a 3.4b 3.4c	S# Sp Un	ECON Cost Summary, Decommissioning Cost Elements	xviii 3-22 3-23 3-24 3-25 3-26 3-28 3-30 3-31 3-32

# Page v of xviii

# TABLE OF CONTENTS

(continued)

SECT	<u>PAGE</u>
	TABLES
3.5	Unit 1, SAFSTOR Alternative, Schedule of Total Annual Expenditures 3-35
3.5a	Unit 1, SAFSTOR Alternative, License Termination Expenditures 3-37
3.5b	Unit 1, SAFSTOR Alternative, Spent Fuel Management Expenditures 3-39
3.5c	Unit 1, SAFSTOR Alternative, Site Restoration Expenditures 3-41
3.6	Unit 2, SAFSTOR Alternative, Schedule of Total Annual Expenditures 3-43
3.6a	Unit 2, SAFSTOR Alternative, License Termination Expenditures 3-45
3.6b	Unit 2, SAFSTOR Alternative, Spent Fuel Management Expenditures 3-47
3.6c	Unit 2, SAFSTOR Alternative, Site Restoration Expenditures
3.7	Unit 3, SAFSTOR Alternative, Schedule of Total Annual Expenditures 3-51
3.7a	Unit 3, SAFSTOR Alternative, License Termination Expenditures 3-53
3.7b	Unit 3, SAFSTOR Alternative, Spent Fuel Management Expenditures 3-55
3.7c	Unit 3, SAFSTOR Alternative, Site Restoration Expenditures
5.1	Unit 1 DECON Alternative, Decommissioning Waste Summary
5.2	Unit 2 DECON Alternative, Decommissioning Waste Summary
5.3	Unit 3 DECON Alternative, Decommissioning Waste Summary
5.4	Unit 1 SAFSTOR Alternative, Decommissioning Waste Summary
5.5	Unit 2 SAFSTOR Alternative, Decommissioning Waste Summary
5.6	Unit 3 SAFSTOR Alternative, Decommissioning Waste Summary
6.1	Unit 1 DECON Alternative, Decommissioning Cost Elements
6.2	Unit 2 DECON Alternative, Decommissioning Cost Elements
6.3	Unit 3 DECON Alternative, Decommissioning Cost Elements
6.4	Unit 1 SAFSTOR Alternative, Decommissioning Cost Elements
6.5	Unit 2 SAFSTOR Alternative, Decommissioning Cost Elements
6.6	Unit 3 SAFSTOR Alternative, Decommissioning Cost Elements6-9
	FIGURES
4.1	Activity Schedule
4.2	Decommissioning Timeline, DECON
4.3	Decommissioning Timeline, SAFSTOR

# TABLE OF CONTENTS

(continued)

SEC	TION	PAGE
	APPENDICES	
A.	Unit Cost Factor Development	A-1
В.	Unit Cost Factor Listing	B-1
C.	•	
D.	Detailed Cost Analysis, SAFSTOR	

# REVISION LOG

No.	CRA No.	Date	Item Revised	Reason for Revision
0		12-22-2008		Final Issue

## EXECUTIVE SUMMARY

This report presents estimates of the cost to decommission the Oconee Nuclear Station (Oconee) for the selected decommissioning scenarios following the scheduled cessation of plant operations. The analysis relies upon site-specific, technical information from an evaluation prepared in 2003, [1] updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The current estimates are designed to provide Duke Energy Corporation, (Duke Energy) with sufficient information to assess the plant owners' financial obligations, as they pertain to the eventual decommissioning of the nuclear plant.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the plant's operating licenses can be terminated. The analysis recognizes that spent fuel will be stored at the site in the plant's storage pools and/or in an independent spent fuel storage installation (ISFSI) until such time that it can be transferred to the U.S. Department of Energy (DOE). Consequently, the estimates also include those costs to manage and subsequently decommission these interim storage facilities.

The currently projected cost to decommission the station, assuming the DECON alternative, is estimated at \$1,571.6 million, as reported in 2008 dollars. An estimate for the SAFSTOR alternative is also provided.

The estimates are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The estimates incorporate a minimum cooling period for the spent fuel that resides in the storage pools when operations cease. Once sufficiently cooled, the spent fuel is transferred to the DOE, along with the spent fuel stored at the ISFSI during plant operations. The estimates also include the dismantling of site structures and non-essential facilities and the limited restoration of the site.

# Alternatives and Regulations

The ultimate objective of the decommissioning process is to reduce the inventory of contaminated and activated material so that the license can be terminated. The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule adopted on June 27, 1988. [2] In this rule, the

<sup>&</sup>lt;sup>1</sup> "Decominissioning Cost Analysis for the Oconee Nuclear Station," Document No. D03-1478-004, Rev. 0, TLG Services, Inc., February 2004

<sup>&</sup>lt;sup>2</sup> U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72 "General Requirements for

NRC set forth financial criteria for decommissioning licensed nuclear power facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

<u>DECON</u> is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." [3]

SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." Decommissioning is to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety.

ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactive material decays to a level permitting unrestricted release of the property." As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years.

The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations, however, rulemaking has been deferred pending the completion of additional research studies, for example, on engineered barriers.

Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

<sup>&</sup>lt;sup>3</sup> Ibid. Page FR24022, Column 3

<sup>1</sup> Ibid.

<sup>&</sup>lt;sup>5</sup> Ibid. Page FR24023, Column 2

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. [6] The amendments allow for greater public participation and better define the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000, further described the methods and procedures acceptable to the NRC staff for implementing the requirements of the 1996 revised rule relating to the initial activities and major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and processes described in the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued in February 2005.<sup>[7]</sup>

# Methodology

The methodology used to develop the estimates described within this document follows the basic approach originally presented in the cost estimating guidelines<sup>[8]</sup> developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit factor method for determining decommissioning activity costs. The unit factors used in this analysis incorporate site-specific costs and the latest available information on worker productivity in decommissioning.

The estimates also reflect lessons learned from TLG's involvement in the Shippingport Station decommissioning, completed in 1989, and the decommissioning of the Cintichem reactor, hot cells and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Connecticut Yankee and San Onofre-1 nuclear units have provided additional insight into the process, the regulatory aspects, and technical challenges of decommissioning commercial nuclear units.

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field engineering, equipment rental, and support services, such as quality control and security.

U.S. Code of Federal Regulations, Title 10, Parts 2, 50, and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, Federal Register Volume 61. (p 39278 et seq.), July 29, 1996

<sup>&</sup>quot;Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, U.S. Nuclear Regulatory Commission, February 2005

<sup>8</sup> T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

## Contingency

Consistent with cost estimating practice, contingencies are applied to the decontamination and dismantling costs developed as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

Contingency funds are expected to be fully expended throughout the program. As such, inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

# Low-Level Radioactive Waste Disposal

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,<sup>[10]</sup> and its Amendments of 1985,<sup>[11]</sup> the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

South Carolina is a member of the three-state Atlantic Interstate Low-Level Radioactive Waste Management Compact, formed after South Carolina formally joined the Northeast Regional Compact. The Barnwell Low-Level Radioactive Waste Management Facility, located in South Carolina, is expected to be available to support the decommissioning of Oconee. It is also assumed that Duke Energy can access other disposal sites should it prove cost-effective. As such, rate schedules for both the Barnwell and EnergySolutions's facility in Clive, Utah are used to generate disposal costs.

For the purpose of this analysis, the EnergySolutions' facility is used as the basis for estimating the disposal cost for the lowest level and majority of the radioactive waste

Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers. Marcel Dokker, Inc., New York, New York, p. 239.

<sup>10 &</sup>quot;Low-Level Radioactive Waste Policy Act of 1980," Public Law 96-573, 1980.

<sup>&</sup>quot;Low-Level Radioactive Waste Policy Λmendments Act of 1985," Public Law 99-240, 1986.

(Class A [12]). EnergySolutions does not have a license to dispose of the more highly radioactive waste (Classes B and C), for example, generated in the dismantling of the reactor vessel. The disposal cost for this material is based upon the rate schedule for the Barnwell facility.

The dismantling of the components residing closest to the reactor core generates radioactive waste considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance. As such, the GTCC radioactive waste has been packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel.

For purposes of this study, GTCC is packaged in the same canisters used for spent fuel. The GTCC material is either stored with the spent fuel at the ISFSI or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates for Oconee reflect the savings from waste recovery/volume reduction.

## High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act" [13] (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The NWPA provided that DOE would enter into contracts with utilities in which DOE would promise to

U.S. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste"

<sup>&</sup>quot;Nuclear Waste Policy Act of 1982 and Amendments," DOE's Office of Civilian Radioactive Management, 1982

take the utilities' spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. The NWPA, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high level waste, as required by the NWPA and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE's breach of contract.

Operation of DOE's yet-to-be constructed repository is contingent upon the review and approval of the facility's license application by the NRC and the successful resolution of pending litigation. The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct the repository at Yucca Mountain, Nevada. Assuming a timely review and adequate funding, the DOE expects that receipt of fuel could begin as early as 2017, [14] although 2020 may be more likely according to the director of the DOE's waste program. [15]

It is generally necessary that spent fuel be cooled and stored for a minimum period at the generating site prior to transfer. As such, the NRC requires that licensees establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy, pursuant to 10 CFR Part 50.54(bb).<sup>[16]</sup> This funding requirement is fulfilled through inclusion of certain cost elements in the decommissioning estimates, for example, associated with the isolation and continued operation of the spent fuel pools and the ISFSI.

According to the spent fuel management plan, at shutdown the spent fuel pools are expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core. Over the following twelve years the assemblies are packaged into multipurpose canisters for transfer to the DOE. It is assumed that this period provides the necessary cooling for the final core to meet the transport requirements for decay heat.

DOE's contracts with utilities order the acceptance of spent fuel from utilities based upon the oldest fuel receiving the highest priority. For purposes of this analysis,

<sup>&</sup>quot;DOE Announces Yucca Mountain License Application Schedule", U.S. Department of Energy's Office of Public Affairs, Press Release July 19, 2006

<sup>&</sup>lt;sup>15</sup> "Testimony of Edward Sproat", Director, Office of Civilian Radioactive Waste Management, before a U.S. House of Representatives subcommittee on the status of Yucca Mountain, July 15, 2008.

U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses."

acceptance of commercial spent fuel by the DOE is expected to begin in 2017 (in accordance with DOE's latest published schedule). The first assemblies removed from the Oconee site are assumed to be in 2018. With an estimated, maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, completion of the removal of fuel from the site is projected to be in the year 2050. Consequently, costs are included within the estimates for the long-term caretaking of the spent fuel at the Oconee site until the year 2050.

An ISFSI, which can be operated under a separate and independent license, has been constructed to support continued plant operations. The facility is not required to support future decommissioning operations, however, there will be spent fuel located at the ISFSI (from plant operations) that will need to be transferred to the DOE during decommissioning. This fuel is assumed to be transferred as the pools are emptied.

Duke Energy's position is that the DOE has a contractual obligation to accept Oconee's fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the station's life if, contrary to its contractual obligation, the DOE has not performed earlier.

## Site Restoration

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities will substantially damage power block structures, potentially weakening the footings and structural supports. Prompt dismantling of site structures (once the facilities are decontaminated) is clearly the most appropriate and cost-effective option. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized on site is more efficient than if the process is deferred. Site facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public and the demolition work force. Consequently, this study assumes that site structures are removed to a nominal depth of three feet below the local grade level wherever possible. The site is then to be graded and stabilized.

#### Summary

The costs to decommission Oconee assumes the removal of all contaminated and activated plant components and structural materials such that the owner may then

have unrestricted use of the site with no further requirements for an operating license. Low-level radioactive waste, other than GTCC waste, is sent to a commercial processor for treatment/conditioning or to a controlled disposal facility.

Decommissioning is accomplished within the 60-year period required by current NRC regulations. In the interim, the spent fuel remains in storage at the site until such time that the transfer to a DOE facility is complete. Once emptied, the storage facilities are also decommissioned.

Both the DECON and SAFSTOR scenarios are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendices C and D. The major cost components are also identified in the cost summary provided at the end of this section.

The cost elements in the estimates are assigned to one of three subcategories: NRC License Termination, Spent Fuel Management, and Site Restoration. The subcategory "NRC License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR Part 50.75). The cost reported for this subcategory is generally sufficient to terminate the unit's operating license, recognizing that there may be some additional cost impact from spent fuel management.

The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to a DOE transport cask, as well as the transfer the fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pools and the management of the ISFSI until such time that the transfer is complete.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., ARO determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, an owner may decide to remove non-contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be

reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of those costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

As noted within this document, the estimates were developed and costs are presented in 2008 dollars. As such, the estimates do not reflect the escalation of costs (due to inflationary and market forces) over the remaining operating life of the plant or during the decommissioning period.

# DECON COST SUMMARY DECOMMISSIONING COST ELEMENTS

(thousands of 2008 dollars)

Cost Element	Unit 1	Unit 2	Unit 3	Total
Decontamination	10,080	12,148	17,119	39,347
Removal	73,211	75,276	118,973	287,460
Packaging	12,144	12,4281	13,244	37,815
Transportation	6,129	6,642	8,194	20,963
Waste Disposal	86,097	K8,9G8	95,945	271,010
Off-site Waste Processing	19,449	20,101	31,808	71,358
Program Management [1]	191,212	166,894	229,584	587,690
Utility Site Indirect	17,743	15,826	19,022	52,591
Spent Fuel Pool Isolation	5,409	5,409	7,212	18,031
Spent Fuel Management [2]	20,790	19,117	22,382	62,288
Insurance and Regulatory Fees	12,660	10,605	10,601	3:3,866
Energy	IOJ)54	10,104	10,086-'-	3/0,84/5
Characterization and Licensing				
Surveys	12,827	10,550	12,812	36,188
Property Taxes	7JiG0	6,5:39	§,8622_	20,951
Miscellaneous Equipment	6,G03	6.4:38	6,[41	19.082
Miscellaneous Site Services	0	0	1.811	1,811
Total [3]	492.4;57	467.045	612.096	1.671.598

Cost Element				
License Termination	398,1142	377,426	468,948	1,244,817
Spent Fuel Management	7],528	67,591	92,545	231,664
Site Restoration	22,487	22,02 <b>7</b> I	GO 603	95.117
Total [3]	492,457	4677,(0.45	612,096	L,571,598

III Includes engineering and seculity costs

Excludes pl'Ogl'am management costs (staffing) but ilicludes costs for spent fuel loading/transfer/spent fuel pool O&iM and EP fees

<sup>131</sup> Columns may not add due to rounding

# SAFSTOR COST SUMMARY DECOMMISSIONING COST ELEMENTS

(thousands of 2008 dollars)

Cost Element	Unit 1	Unit 2	Unit 3	Total
Decomtamination	9,338	9,273	12,090	30,701
Removal	72,536	74,4521	117,255	264,243
Packaging	9,020 r	9,187	9,742	27,949
Transportation	5,106	5,327	6,260	16,694
Waste Disposal	69,540	71,445	76,348	217,334
Off-site Waste Processing	21,821	22,790	35,145	79,756
Program Management [#	268,845	208,870	255,960	733,676
Utility Site Indirect	23,160	17,810	20,652	61,621
Spent: Fuel Pool Isolation	5.409	5;409	7.21.2	18,031
Spent Fuel Management 2	20,682	19,009	21,316	61,007
Insurance and Regulatory Fees	34,210	32,043	332,146 j	98,399
Energy	17,770	IJ.556	17.892	53,21,7
Characterization and Licensing Surveys	14,274	11,997	14,259	40,531
Property Taxes	7,880	6,870	7.182	21,932
Miscellaneous Equipment	16,083	16,035	18.46G	50,5§2.
Miscellaneous Site Services	0		U§11	1,811
Total 🕅	5)95,67fi	S2R.074	G5)337:17	1.777485

Cost Elliment	r			
License Termination	500,989	4:35,993	518,504	1,455,486
Spent Fuel Management H	64,675	G2,5R8	68,473	195,736
Site Restoration	\- 30,011	29,400.2	66.760	126, <b>263</b> 1 <b>26</b>
Total III	595,675	5328,074L	65;:3,7::37	1,777,485

- [iii Includes; engineering and security costs
- Direct costs only, excludes progl'am management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&IM and EP fees
- Pil Columns may not add due to rounding
- Iff Includes percentage of Period 2a (dormancy) plant operatibling costs until sperint fuel pools are emptied, in addition to the direct costs

#### 1. INTRODUCTION

This report presents estimates of the costs to decommission the Oconee Nuclear Station, (Oconee) following a scheduled cessation of plant operations. The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2003, [1]\* updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The current estimates are designed to provide Duke Energy Corporation (Duke Energy) with sufficient information to assess the plant owners' financial obligations, as they pertain to the eventual decommissioning of the nuclear station. It is not a detailed engineering document, but a financial analysis prepared in advance of the detailed engineering that will be required to carry out the decommissioning.

## 1.1 OBJECTIVES OF STUDY

The objectives of this study are to prepare comprehensive estimates of the costs to decommission the three nuclear units at Oconee, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities. For the purposes of this study, the shutdown dates for the units are assumed to be February 6, 2033, October 6, 2033 and July 19, 2034, for Units 1, 2 and 3, respectively, based upon the current operating licenses.

#### 1.2 SITE DESCRIPTION

The Oconee nuclear station is located in Oconee County, approximately 35 miles west of Greenville, South Carolina on the shore of Lake Keowee. The station is comprised of three nuclear units and an independent spent fuel storage installation (ISFSI). All three units are essentially identical except for certain auxiliary systems. In particular, one spent fuel pool is shared between Oconee 1 and 2, and a separate spent fuel pool is provided for Oconee 3.

Lake Keowee, created with the construction of the Keowee and Little River Dams, provides both the power source for the Keowee Hydroelectric Station, as well as the heat sink for the nuclear units. Both facilities were planned and constructed concurrently, to the extent that the Oconee intake dike structure forms part of the Keowee lake boundary. The turbine building houses turbine-generator sets for all three units. The pedestal structure for each is independent; only the steel superstructure is common to all three units.

<sup>\*</sup> References provided in Section 7 of the document

The nuclear steam supply system (NSSS) for each unit consists of a pressurized water reactor and a two-loop reactor coolant system. The systems were supplied by the Babcock & Wilcox Company and have a referenced core design of 2568 MWt (thermal) with the reactor at rated power and a net dependable capability rating of 860 MWe (electric).

The reactor coolant system is comprised of the reactor vessel, two vertical oncethrough steam generators, four shaft-sealed reactor coolant pumps, an electrically heated pressurizer and interconnected piping. The system is housed within the reactor or "containment" building, a conventionally reinforced, post-tensioned structure. The building consists of a right circular cylinder and dome, connected to and supported by a massive reinforced concrete foundation slab. The entire interior surface is lined with a ¼ inch thick welded steel plate to assure a high degree of leak tightness.

Heat produced in the reactor is converted to electrical energy by the steam and power conversion system. A turbine-generator converts the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy. Each unit's turbine generator consists of a tandem (single shaft) arrangement of double-flow high-pressure turbine and three identical double-flow low pressure turbines driving a direct coupled generator at 1800 rpm. The turbines are operated in a closed feedwater cycle, which condenses the steam. The heated feedwater is returned to the steam generators.

The condenser circulating water system removes heat rejected in the main condensers and is the ultimate heat sink for the station. The Little River arm of Lake Keowee is the source of water for the system. Each unit has four condenser circulating water pumps supplying water into a common condenser intake header under the turbine building floor. The condenser discharge is returned to the Keowee River arm of Lake Keowee.

The ISFSI installation consists of concrete bunkers with shield doors and air cooling vents, all for housing the spent fuel. The spent fuel is stored within the concrete bunkers in stainless steel canisters. The ISFSI is licensed as a Title 10 of the Code of Federal Regulations (10 CFR) §72 facility.

## 1.3 REGULATORY GUIDANCE

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988. <sup>[2]</sup> This rule set forth financial criteria for decommissioning licensed nuclear power facilities.

The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the plant's systems, structures and facilities are removed or decontaminated to levels that permit the site to be released for unrestricted use shortly after the cessation of plant operations. The rule also placed limits on the time allowed to complete the decommissioning process. For SAFSTOR, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. The guidelines for ENTOMB are similar, providing the NRC with both sufficient leverage and flexibility to ensure that these deferred options are only used in situations where it is reasonable and consistent with the definition of decommissioning. At the conclusion of a 60-year dormancy period (or longer for ENTOMB if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. However, with rulemaking permitting the controlled release of a site, he NRC has re-evaluated this alternative. The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most reactors. However, the staff also found that additional rulemaking would be needed before this option could be treated as a generic alternative. The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments. However, the NRC's staff has recommended that rulemaking be deferred, based upon several factors, e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities, at least until after the additional

research studies are complete. The Commission concurred with the staff's recommendation.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants. When the decommissioning regulations were adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after the decision to cease operations. Certification will also be required once the fuel is permanently removed from the reactor vessel. Submittal of these notices will entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee is required to submit an application to the NRC to terminate the license, which will include a license termination plan (LTP).

#### 1.3.1 Nuclear Waste Policy Act

Congress passed the "Nuclear Waste Policy Act" (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The NWPA provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities' spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. The NWPA, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high level waste, as required by the NWPA and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE's breach of contract.

Operation of DOE's yet-to-be constructed repository is contingent upon the review and approval of the facility's license application by the NRC and the successful resolution of expected contentions and litigation. The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct the repository at Yucca Mountain, Nevada. Assuming a timely review, and adequate funding, the DOE expects that receipt of fuel could begin as early as 2017.<sup>[8]</sup>

It is generally necessary that spent fuel be actively cooled and stored for a minimum period at the generating site prior to transfer. As such, the NRC requires that licensees establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy, pursuant to 10 CFR Part 50.54(bb).<sup>[9]</sup> This funding requirement is fulfilled through inclusion of certain cost elements in the decommissioning estimate, for example, associated with the isolation and continued operation of the spent fuel pools and ISFSI.

According to the spent fuel management plan, at shutdown the spent fuel pools are expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core. Over the following twelve years the assemblies are packaged into multipurpose canisters for transfer to the DOE. It is assumed that this period provides the necessary cooling for the final core to meet the transport requirements for decay heat.

DOE's contracts with utilities order the acceptance of spent fuel from utilities based upon the oldest fuel receiving the highest priority. For purposes of this analysis, acceptance of commercial spent fuel by the DOE is expected to begin in 2017 (in accordance with DOE's latest published schedule). The first assemblies removed from the Oconee site are assumed to be in 2018. With an estimated maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year from the commercial generators, completion of the removal of fuel from the Oconee site is projected to be in the year 2050. Consequently, costs are included within

the estimates for the long-term caretaking of the spent fuel at the Oconee site until the year 2050.

An ISFSI, which can be operated under a separate and independent license, has been constructed to support continued plant operations. The facility is not required to support future decommissioning operations, however, there will be spent fuel located at the ISFSI (from plant operations) that will need to be transferred to the DOE during decommissioning. This fuel is assumed to be transferred as the pools are emptied.

Duke Energy's position is that the DOE has a contractual obligation to accept Oconee's fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the station's life if, contrary to its contractual obligation, the DOE has not performed earlier.

#### 1.3.2 Low-Level Radioactive Waste Acts

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980, [10] and its Amendments of 1985, [11] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

South Carolina is a member of the three-state Atlantic Interstate Low-Level Radioactive Waste Management Compact, formed after South Carolina formally joined the Northeast Regional Compact. The Barnwell Low-Level Radioactive Waste Management Facility, located in South Carolina, is expected to be available to support the decommissioning of Oconee. It is also assumed that Duke Energy can access other disposal sites should it prove cost-effective. As such, rate schedules for both the Barnwell and EnergySolutions's facility in Clive, Utah are used to generate disposal costs.

For the purpose of this analysis, the EnergySolutions' facility is used as the basis for estimating the disposal cost for the lowest level and majority of the radioactive waste (Class A [12]). EnergySolutions does not have a license to dispose of the more highly radioactive waste (Classes B and C), for example, generated in the dismantling of the reactor vessel. The disposal cost for this material is based upon the rate schedule for the Barnwell facility.

The dismantling of the components residing closest to the reactor core generates radioactive waste considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance. As such, the GTCC radioactive waste has been packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel.

For purposes of this study, GTCC is packaged in the same canisters used for spent fuel. The GTCC material is either stored with the spent fuel or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates for Oconee reflect the savings from waste recovery/volume reduction.

# 1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination," [13] amending 10 CFR Part 20. This subpart provides radiological criteria for releasing a facility for unrestricted use.

The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The decommissioning estimates assume that the Oconee site will be remediated to a residual level consistent with the NRC-prescribed level. It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). [14] An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water. [15]

On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU)<sup>[16]</sup> provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

#### 2. DECOMMISSIONING ALTERNATIVES

Detailed cost estimates were developed to decommission the Oconee nuclear plant for the following approved decommissioning alternatives: DECON and SAFSTOR. Although the alternatives differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work, i.e., engineering and planning at the time of decommissioning.

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations (i.e., power production) to facility de-activation and closure. During the first phase, notification is to be provided to the NRC certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee is then prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for Oconee are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in the projected expenditures.

## 2.1 DECON

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to an off-site disposal facility.

## 2.1.1 Period 1 - Preparations

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. Through implementation of a staffing transition plan, the organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications applicable to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

## Engineering and Planning

The PSDAR, required within two years of the notice to cease operations, provides a description of the licensee's planned decommissioning activities, a timetable, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local hearing to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure, i.e., without specific NRC approval. Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

- foreclose release of the site for possible unrestricted use,
- significantly increase decommissioning costs,
- cause any significant environmental impact, or
- violate the terms of the licensee's existing license.

Existing operational technical specifications are reviewed and modified to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities is also considered.

Typically, a licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than that bounded by previously evaluated environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, work packages and procedures, would be assembled to support the proposed decontamination and dismantling activities.

# Site Preparations

Following final plant shutdown, and in preparation for actual decommissioning activities, the following activities are initiated:

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the reactor vessel and its internals), internal piping, and primary shield cores.
- Isolation of the spent fuel storage pools and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. The pools will remain operational for approximately twelve years following the cessation of operations before the inventory resident at shutdown can be transferred to the DOE.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and nonmetallic components generated in decommissioning), site security and emergency programs, and industrial safety.

## 2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful termination of the 10 CFR §50 operating license. Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. This may include a centralized processing area to facilitate equipment removal and component preparations for off-site disposal.
- Reconfiguration and modification of site structures and facilities as needed to support decommissioning operations. This may include the upgrading of roads (on- and off-site) to facilitate hauling and transport. Modifications may be required to the containment structure to facilitate access of large/heavy equipment. Modifications may also be required to the refueling area of the building to support the segmentation of the reactor vessel internals and component extraction.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.
- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages for the disposition of low-level radioactive waste.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from the reactor vessel head. Segmentation of the vessel closure head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks, i.e., by weight and activity. The operations are conducted under water using remotely operated tooling and contamination controls.

- Disassembly and segmentation of the remaining reactor internals, including the core shroud and lower core support assembly. Some material is expected to exceed Class C disposal requirements. As such, the segments will be packaged in modified fuel storage canisters for geologic disposal.
- Segmentation of the reactor vessel. A shielded platform is installed for segmentation as cutting operations are performed in-air using remotely operated equipment within a contamination control envelope. The water level is maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the associated cubicles necessary for access and component extraction are removed.
- Removal of the steam generators and pressurizer for material recovery and controlled disposal. The generators will be moved to an on-site processing center and prepared for transport to the disposal site. To facilitate transport, the generators are cut in half, across the tube bundle. The exposed ends are capped and sealed. The segments can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized, e.g., with grout. Steel shielding will be added, as necessary, to those external areas of the package to meet transportation limits and regulations. The retired units in storage at the site will be handled in a similar manner.

At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local hearing. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).
- Removal of the steel liners from refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/contaminated concrete.
- Surveys of the decontaminated areas of the containment structure.
- Remediation and removal of the contaminated equipment and material from the auxiliary and fuel buildings and any other contaminated facility. Radiation and contamination controls will be utilized until residual levels indicate that the structures and equipment can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these buildings. This activity facilitates surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)." This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies state-of-the-art, commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on final termination of the license.

The NRC will terminate the operating licenses if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release.

# 2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities will begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled, safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures including the reactor and auxiliary buildings. Under certain circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the station.

Prompt dismantling of site structures is clearly the most appropriate and cost-effective option. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized on site is more efficient than if the process were deferred. Site facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public as well as to future workers. Abandonment creates a breeding ground for vermin infestation as well as other biological hazards.

This cost study presumes that non-essential structures and site facilities are dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are removed to a nominal depth of three feet below grade. The three-foot depth allows for the placement of gravel for drainage, as well as topsoil, so that vegetation can be established for erosion control. Site areas affected by the dismantling activities are restored and the plant area graded as required to prevent ponding and inhibit the refloating of subsurface materials.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. The processed material is then used on site to backfill foundation voids. Excess non-contaminated materials are trucked to an off-site area for disposal as construction debris.

# 2.1.4 ISFSI Operations and Decommissioning

The ISFSI will continue to operate under a separate and independent license (10 CFR §72) following the termination of the §50 operating licenses. Assuming the DOE starts accepting fuel from Oconee in 2018, transfer of spent fuel from the ISFSI is anticipated to continue through the year 2050.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission will terminate the §72 license when it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license for the ISFSI.

The ISFSI is comprised of a series of horizontal storage modules and dry storage canisters located on pre-cast concrete storage pads. For purposes of this cost analysis, it is assumed that once the inner canisters containing the spent fuel assemblies have been removed, any required decontamination performed, and the license for the facility terminated, the modules can be dismantled using conventional techniques for the demolition of reinforced concrete. The concrete storage pads will then be removed, and the area graded and landscaped to conform to the surrounding environment.

## 2.2 SAFSTOR

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems that are not required to support the spent fuel pools or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of

remaining contamination is performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative, although a shorter time period is expected for these activities due to the more limited work scope. Site preparations are also similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

# 2.2.1 Period 1 - Preparations

Preparations for long-term storage include the planning for permanent defueling of the reactor, revision of technical specifications appropriate to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

The process of placing the plant in safe-storage includes, but is not limited to, the following activities:

- Isolating of the spent fuel storage services and fuel handling systems so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are scheduled around the fuel handling systems to the greatest extent possible.
- Transferring of the spent fuel from the storage pools to the DOE, following the minimum required cooling period in the spent fuel pools.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.
- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessel, with the internals left in place and the vessel head secured.
- Draining and de-energizing non-essential, contaminated systems with decontamination as required for future maintenance and inspection.

- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey of plant, posting warning signs where appropriate.
- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.
- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

## 2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented and/or detected and controlled. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to prevent unauthorized entry and to protect the public from the consequences of its own actions. The security fence, sensors, alarms, and other surveillance equipment provide security. Fire and radiation alarms are also monitored and maintained.

Consistent with the DECON scenario, the spent fuel storage pools are emptied within twelve years of the cessation of operations. The transfer of the spent fuel to the DOE continues throughout the dormancy period until completed in 2050. Once emptied, the ISFSI is secured for storage and decommissioned along with the power block structures in Period 4.

After an optional period of storage (such that license termination is accomplished within 60 years of final shutdown), it is required that the licensee submit an application to terminate the license, along with an LTP (described in Section 2.1.2), thereby initiating the third phase.

## 2.2.3 Periods 3 and 4 - Delayed Decommissioning

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning for activities and the writing of activity specifications and detailed procedures are also initiated at this time.

Much of the work in developing a termination plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase and the follow-on decontamination and dismantling processes are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and this deferred scenario is the absence, in the latter, of any constraint on the availability of the fuel storage facilities for decommissioning.

Variations in the length of the dormancy period are expected to have little effect upon the quantities of radioactive wastes generated from system and structure removal operations. Given the levels of radioactivity and spectrum of radionuclides expected from sixty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone, i.e., there is no significant reduction in the waste generated from the decommissioning activities. However, due to the lower activity levels, a greater percentage of the waste volume can be designated for off-site processing and recovery.

The delay in decommissioning also yields lower working area radiation levels. As such, the estimate for this delayed scenario incorporates

reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

Although the initial radiation levels due to <sup>60</sup>Co will decrease during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as <sup>94</sup>Nb, <sup>59</sup>Ni, and <sup>63</sup>Ni. Therefore, the dismantling procedures described for the DECON alternative would still be employed during this scenario. Portions of the biological shield will still be radioactive due to the presence of activated trace elements with long half-lives (<sup>152</sup>Eu and <sup>154</sup>Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

## 2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities can begin. Dismantling, as a continuation of the decommissioning process, is clearly the most appropriate and cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost in this scenario is consistent with that described for DECON, presuming the removal of structures and site facilities to a nominal depth of three feet below grade and the limited restoration of the site.

### 3. COST ESTIMATE

The cost estimates prepared for decommissioning Oconee consider the unique features of the site, including the NSSS, power generation systems, support services, site buildings, and ancillary facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

### 3.1 BASIS OF ESTIMATE

The estimates were developed using the site-specific, technical information from the 2003 analysis. This information was reviewed for the current analysis and updated as deemed appropriate. The site-specific considerations and assumptions used in the previous evaluation were also revisited. Modifications were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

### 3.2 METHODOLOGY

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report. "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," [18] and the DOE "Decommissioning Handbook." [19] These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal (\$/cubic yard), steel removal (\$/ton), and cutting costs (\$/inch) are developed using local labor rates. The activity-dependent costs are estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures rely upon information available in the industry publication, "Building Construction Cost Data," published by R.S. Means. [20]

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

This analysis reflects lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, and San Onofre-1 nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

### Work Difficulty Factors

TLG has historically applied work difficulty adjustment factors (WDFs) to account for the inefficiencies in working in a power plant environment. WDFs are assigned to each unique set of unit factors, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

6	Access Factor	10% to 20%
65	Respiratory Protection Factor	10% to 50%
	Radiation/ALARA Factor	10% to 37%
	Protective Clothing Factor	10% to 30%
0	Work Break Factor	8.33%

The factors and their associated range of values were developed in conjunction with the AIF/NESP-036 study. The application of the factors is discussed in more detail in that publication.

# Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiologically controlled areas. The resulting man-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities is based upon productivity information available from the "Building Construction Cost Data" publication.

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field engineering, equipment rental, and support services such as quality control and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

# 3.3 IMPACT OF DECOMMISSIONING MULTIPLE REACTOR UNITS

In estimating the near simultaneous decommissioning of three co-located reactor units there can be opportunities to achieve economies of scale, by sharing costs between units, and coordinating the sequence of work activities. There will also be schedule constraints, particularly where there are requirements for specialty equipment and staff, or practical limitations on when final status surveys can take place. For purposes of the estimate, the units are assumed to be essentially identical. Common facilities have been assigned to Unit 3. A summary of the principal impacts are listed below.

- The sequence of work generally follows the principal that the work is done at Unit 1 first, followed by similar work at Units 2 and 3. This permits the experience gained at Unit 1 to be applied by the workforce at the other units. It should be noted however, that the estimate does not consider productivity improvements at the second and third units, since there is little documented experience with decommissioning three units simultaneously. The work associated with developing activity specifications and procedures can be considered essentially identical between the three units, therefore the second and third unit costs are assumed to be a fraction of the first unit (~ 43%).
- Segmenting the reactor vessel and internals will require the use of special equipment. The decommissioning project will be scheduled such that Unit 2's reactor internals and vessel are segmented immediately after the activities at Unit 1 have been completed.
- Some program management and support costs, particularly costs associated with the more senior positions, can be avoided with three reactors undergoing decommissioning simultaneously. As a result, the estimate is based on a "lead" unit that includes these senior positions, and a "second" unit that excludes these positions. The designation as lead is based on the unit undertaking the most complex tasks (for instance vessel segmentation) or performing tasks for the first time.
- The final radiological survey schedule is also affected by a three-unit decommissioning schedule. It would be considered impractical to try to complete the final status survey of Unit 1, while Units 2 and 3 still have ongoing radiological remediation work and waste handling in process. As such, the transfer of the spent fuel from the storage pools and subsequent

decontamination of the fuel handling buildings is coordinated so as to synchronize the final status survey for the station.

- The final demolition of buildings at the site is considered to take place concurrently. This is considered a reasonable assumption since access to the buildings is considered good at the station.
- Unit 1, as the first unit to enter decommissioning, incurs the majority of site characterization costs.
- Shared systems and common structures are generally assigned to Unit 3.
- Station costs such as emergency response fees, regulatory agency fees, corporate overhead, and insurance are generally allocated on an equal basis between the three units.

### 3.4 FINANCIAL COMPONENTS OF THE COST MODEL

TLG's proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination and site restoration.

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

# 3.4.1 Contingency

The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook" [21] as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice,

contingency is included. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for percentage contingency in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

0	Decontamination	50%
	Contaminated Component Removal	25%
0	Contaminated Component Packaging	10%
0	Contaminated Component Transport	15%
	Low-Level Radioactive Waste Disposal	25%
	Low-Level Itauloactive waste Disposal	2070
0	Reactor Segmentation	75%
9	NSSS Component Removal	25%
	Reactor Waste Packaging	25%
0	Reactor Waste Transport	25%
0	Reactor Vessel Component Disposal	50%
	GTCC Disposal	15%
0	Non-Radioactive Component Removal	15%
0	Heavy Equipment and Tooling	15%
a	Supplies	25%
0	Engineering	15%
	Energy	15%
0	Characterization and Termination Surveys	30%
0	Construction	15%
0	Taxes and Fees	10%
0	Insurance	10%
0	Staffing	15%
	~ ~~~~~	1.070

The contingency values are applied to the appropriate components of the estimates on a line item basis. A composite value is then reported at the end of each detailed estimate (as provided in Appendix C and D). For example, the composite contingency value reported for the DECON alternative in Appendix C is approximately 19.6% and for the SAFSTOR alternative in Appendix D is approximately 18.1%.

# 3.4.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term "financial risk." Included within the category of financial risk are:

- Transition activities and costs: ancillary expenses associated with eliminating 50% to 80% of the site labor force shortly after the cessation of plant operations, added cost for worker separation packages throughout the decommissioning program, national or company-mandated retraining, and retention incentives for key personnel.
- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.
- Regulatory changes, for example, affecting worker health and safety, site release criteria, waste transportation, and disposal.
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition), or in the timetable for such, for example, the start and rate of acceptance of spent fuel by the DOE.

• Pricing changes for basic inputs such as labor, energy, materials, and disposal. Items subject to widespread price competition (such as materials) may not show significant variation; however, others such as waste disposal could exhibit large pricing uncertainties, particularly in markets where limited access to services is available.

It has been TLG's experience that the results of a risk analysis, when compared with the base case estimate for decommissioning, indicate that the chances of the base decommissioning estimate being too high is a low probability, and the chances that the estimate is too low is a higher probability. This is mostly due to the pricing uncertainty for low-level radioactive waste burial, and to a lesser extent due to schedule increases from changes in plant conditions and to pricing variations in the cost of labor (both craft and staff). This cost study, however, does not add any additional costs to the estimate for financial risk, since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk are revisited periodically and addressed through repeated revisions or updates of the base estimates.

### 3.5 SITE-SPECIFIC CONSIDERATIONS

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impact of the considerations identified below is included in this cost study.

### 3.5.1 Spent Fuel Management

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimates to decommission Oconee. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the Nuclear Waste Policy Act. As such, the disposal cost is financed by a 1 mill/kWhr surcharge paid into the DOE's waste fund during operations. However, the NRC requires licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy. This funding requirement is fulfilled through inclusion of certain high-level waste cost elements within the estimates, as described below.

Completion of the decommissioning process is highly dependent upon the DOE's ability to remove spent fuel from the site. The timing for removal of spent fuel from the site is based upon the DOE's most recently published annual acceptance rates of 400 MTU/year for year 1, 3,800 MTU total for years 2 through 4 and 3,000 MTU/year for year 5 and beyond. PDE contracts provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing priority acceptance from permanently shutdown nuclear reactors. Because it is unclear how these mechanisms may operate once DOE begins accepting spent fuel from commercial reactors, this study assumes that DOE will accept spent fuel in an oldest fuel first order.

### **ISFSI**

An ISFSI, which can be operated under a separate and independent license, has been constructed to support continued plant operations. The facility is not required to support future decommissioning operations; however, there will be spent fuel located at the ISFSI (from plant operations) that will need to be transferred to the DOE during decommissioning. This fuel is assumed to be transferred as the pools are emptied.

The ISFSI will continue to operate throughout decommissioning, and beyond the termination of the operating license in the DECON decommissioning scenario, until such time that the transfer of spent fuel to the DOE can be completed. Assuming that DOE commences repository operation in 2017, Oconee fuel is projected to be removed from the site beginning in 2018. The process is expected to be completed by the year 2050, based upon the current shutdown dates, as delineated in Table 3.1. The scenario is similar for the SAFSTOR alternative; however, based upon the expected completion date for fuel transfer, the ISFSI will be emptied prior to the commencement of decommissioning operations.

Operation and maintenance costs for the spent fuel pools and the ISFSI are included within the estimates and address the cost for staffing the facility, as well as security, insurance, and licensing fees. Costs are also provided for the final disposition of the facilities once the transfer is complete.

### Storage Canister Design

A multi-purpose storage canister, with a 24-fuel assembly capacity, is assumed to be used at the ISFSI and in the transfer of spent fuel to the DOE. For fuel transferred directly from the pools to the DOE, the DOE

is assumed to provide Transport, Aging and Disposal (TAD) canisters with a 21 assembly capacity at no additional cost to the owner.

# Canister Loading and Transfer

An average cost of \$1,800 per assembly is used for the labor and equipment to seal and load each spent fuel canister into the DOE transport cask from the wet storage pools. For estimating purposes, 50% of this cost is used to estimate the cost to transfer the fuel from the ISFSI into the transport cask. An additional cost of \$100,000 is used for the labor and equipment to perform the closure and testing of the TAD cask for shipment to the DOE repository.

# Operations and Maintenance

An annual cost (excluding labor) of approximately \$745,000 and \$109,000 are used for operation and maintenance of the spent fuel pools and the ISFSI, respectively. Pool operations are expected to continue approximately twelve years after the cessation of operations. ISFSI operating costs are based upon a 16 year period of operations following the cessation of operations at the last unit.

### ISFSI Design Considerations

A multi-purpose (storage and transport) dry shielded storage canister with a horizontal, reinforced concrete storage module is used as a basis for the cost analysis. The storage modules, are assumed to have some level of neutron-induced activation as a result of the long-term storage of the fuel (i.e., to levels exceeding free-release limits). The steel support structure is assumed to be removed from these modules for controlled disposal. The cost of the disposition of this material, as well as the demolition of the ISFSI facility, is included in the estimate.

### GTCC

The dismantling of the reactor internals generates radioactive waste considered unsuitable for shallow land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable

costs of disposing of such waste. Although there are strong arguments that GTCC waste is covered by the spent fuel contact with DOE and the fees being paid pursuant to that contract, DOE has taken the position that GTCC waste is not covered by that contract or its fees and that utilities, including Duke Energy, will have to pay an additional fee for the disposal of their GTCC waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance. As such, the GTCC radioactive waste has been packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel.

For purposes of this study, GTCC is packaged in the same canisters used to store spent fuel. Disposal costs are based upon a cost equivalent to that envisioned for the spent fuel. It is not anticipated that the DOE would accept this waste prior to completing the transfer of spent fuel. Therefore, until such time the DOE is ready to accept GTCC waste, it is reasonable to assume that this material would remain in storage with the spent fuel in the ISFSI at the Oconee site (for the DECON alternative). In the SAFSTOR scenario, the GTCC material is shipped directly to a DOE facility as it is generated since the fuel has been removed from the site prior to the start of decommissioning and the ISFSI deactivated.

# 3.5.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is performed in the refueling canal, where a turntable and remote cutter are installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology.

Intact disposal of reactor vessel shells has been successfully demonstrated at several of the sites currently being decommissioned. Access to navigable waterways has allowed these large packages to be transported to the Barnwell disposal site with minimal overland travel. Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact

package (including the internals). However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,
- there were no man-made or natural terrain features between the plant site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

It is not known whether this option will be available when the Oconee plant ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, the study assumes the reactor vessel will require segmentation, as a bounding condition.

### 3.5.3 Primary System Components

In the DECON scenario, the reactor coolant system components are assumed to be decontaminated using chemical agents prior to the start of dismantling operations. This type of decontamination can be expected to have a significant ALARA impact, since in this scenario the removal work is done within the first few years of shutdown. A decontamination factor (average reduction) of 10 is assumed for the process. Disposal of the decontamination solution effluent is included within the estimate as a "process liquid waste" charge. In the SAFSTOR scenario, radionuclide decay is expected to provide the same benefit and, therefore, a chemical decontamination is not included.

The following discussion deals with the removal and disposition of the steam generators, but the techniques involved are also applicable to other large components, such as heat exchangers, component coolers, and the pressurizer. The steam generators' size and weight, as well as

their location within the reactor building, will ultimately determine the removal strategy.

A trolley crane is set up for the removal of the generators. It can also be used to move portions of the steam generator cubicle walls and floor slabs from the reactor building to a location where they can be decontaminated and transported to the material handling area. Interferences within the work area, such as grating, piping, and other components are removed to create sufficient laydown space for processing these large components.

The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they are lowered onto a dolly. Each generator is rotated into the horizontal position for extraction from the containment and placed onto a multi-wheeled vehicle for transport to an on-site processing and storage area.

The generators are segmented on-site to facilitate transportation. Each unit is cut in half, across the tube sheet. The exposed ends are capped and sealed. The interior volume is filled with low-density cellular concrete for stabilization of the internal contamination. Each component is then loaded onto a rail car for transport to the disposal facility.

Disposal costs are based upon the internal volume and weight of the units. Each component is then loaded onto a rail car for transport to the disposal facility.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

## 3.5.4 Retired Components

The estimate includes the cost to dispose of six retired steam generators expected to be in storage at the site upon the cessation of plant operations. The components are processed for disposal in the same manner as described for the installed units.

### 3.5.5 Main Turbine and Condenser

The main turbine is dismantled using conventional maintenance procedures. The turbine rotors and shafts are removed to a laydown area. The lower turbine casings are removed from their anchors by controlled demolition. The main condensers are also disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it is surveyed and designated for either decontamination or volume reduction, conventional disposal, or controlled disposal. Components are packaged and readied for transport in accordance with the intended disposition.

# 3.5.6 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.\(^{123}\) The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in subpart 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported in accordance with Part 71, as Type B. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., <sup>137</sup>Cs, <sup>90</sup>Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major reactor components to be shipped under current transportation regulations and disposal requirements.

Transport of the highly activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, rail, and/or multi-wheeled transporter.

Transportation costs for material requiring controlled disposal are based upon the mileage to the Barnwell facility and/or the EnergySolutions facility in Clive, Utah. Transportation costs for off-site waste processing are based upon the mileage to Memphis, Tennessee. Truck transport costs are estimated using published tariffs from Tri-State Motor Transit. [24]

# 3.5.7 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is processed to reduce the total cost of controlled disposal. Material meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning (preparing the material to meet the waste acceptance criteria of the disposal site) and recovery of the waste stream is performed off site at a licensed processing center. Any material leaving the site is subject to a survey and release charge, at a minimum. Based on TLG's experience, rates were assumed for off-site processing as well as survey and release.

The mass of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in the detailed Appendices C and D, and summarized in Section 5. The quantified waste summaries shown in these tables are consistent with 10 CFR Part 61 classifications. Commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The volumes are calculated based on the exterior package dimensions for containerized material or a specific calculation for components serving as their own waste containers.

The more highly activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

Disposal fees are based upon estimated charges, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the lowest level and majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at EnergySolutions facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) are based upon the rate schedule for the Barnwell facility.

# 3.5.8 Site Conditions Following Decommissioning

The NRC will terminate (or amend) the site license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Local building codes and state environmental regulations will dictate the next step in the decommissioning process, as well as the owner's own future plans for the site.

All structures will be removed except for the switchyard. The switchyard is required for grid operations. Structures to be removed include but are not limited to the Reactor Buildings, Auxiliary Buildings, Fuel Buildings, Service Building, Turbine Buildings, Intake and Condenser Discharge Structures. The landfill and shooting range will be remediated and closed.

The structures that may require decontamination or radiological remediation are the Reactor Buildings, Auxiliary Buildings, Hot Machine Shops, Interim Radwaste Building, Radwaste Facility, Fuel Building and the Retired Steam Generator Storage Facility and the ground floor of the Turbine Building.

The estimates presented herein include the dismantling of the major structures to a nominal depth of three feet below grade, backfilling and the collapsing of below grade voids, and general terra-forming such that the site upon which the power block and supplemental structures are located is transformed into a "grassy plain."

The estimates do not assume the remediation of any significant volume of contaminated soil. This assumption may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

Costs are included for the remediation and post-closure care and maintenance of the landfill and shooting range at the site. Since the care and maintenance of the landfill will extend beyond the active decommissioning period, a lump-sum perpetuity payment is included in the final year of decommissioning for the remaining duration.

### Environmental Remediation

Oconee has a cement lined lagoon and three chemical treatment ponds that may require some remediation. The cost of such is not included within the current estimates.

# 3.6 ASSUMPTIONS

The following are the major assumptions made in the development of the estimates for decommissioning the site.

## 3.6.1 Estimating Basis

The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

### 3.6.2 Labor Costs

The craft labor required to decontaminate and dismantle the nuclear plant is acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis.

Duke Energy will continue to provide site operations support, including decommissioning program management, licensing, radiological protection, and site security. Duke Energy will serve as the Decommissioning Operations Contractor, providing the supervisory staff needed to oversee the labor subcontractors, consultants, and specialty contractors needed to perform the work envisioned in the decontamination and dismantling effort. Duke Energy will also provide the engineering services needed to develop activity specifications,

detailed procedures, detailed activation analyses, and support field activities such as structural modifications. Severance and retention costs are not included in the estimate. Reduction in staff levels will be handled through normal staffing processes.

Personnel costs are based upon average salary information provided by Duke Energy. Overhead costs are included for site and corporate support, reduced commensurate with the staffing of the project.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel.

## 3.6.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., <sup>137</sup>Cs, <sup>90</sup>Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major NSSS components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.<sup>[25]</sup> Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Oconee components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from CR-0130<sup>[26]</sup> and CR-0672,<sup>[27]</sup> and benchmarked to the long-lived values from CR-3474.

The control elements are disposed of along with the spent fuel, i.e., there is no additional cost provided for their disposal.

Activation of the containment building structure is confined to the biological shield. More extensive activation (at very low levels) of the interior structures within containment has been detected at several reactors and the owners have elected to dispose of the affected material at a controlled facility rather than reuse the material as fill on site or send it to a landfill. The ultimate disposition of the material removed from the containment building will depend upon the site release criteria selected, as well as the designated end use for the site.

### 3.6.4 General

## Transition Activities

Existing warehouses are cleared of non-essential material and remain for use by Duke Energy and its subcontractors. The plant's operating staff performs the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.
- Process operating waste inventories, i.e., the estimates do not address the disposition of any legacy wastes; the disposal of operating wastes during this initial period is not considered a decommissioning expense.

# Scrap and Salvage

The existing plant equipment is considered obsolete and suitable for scrap as deadweight quantities only. Duke Energy will make economically reasonable efforts to salvage equipment following final plant shutdown. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the value that an owner may realize based upon those efforts.

It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be more than offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimates do not include the additional cost for size reduction and preparation to meet "furnace ready" conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation,

an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property is removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts are also made available for alternative use.

## Energy

For estimating purposes, the plant is assumed to be de-energized, with the exception of those facilities associated with spent fuel storage. Replacement power costs are used to calculate the cost of energy consumed during decommissioning for tooling, lighting, ventilation, and essential services.

### Insurance

Costs for continuing coverage (nuclear liability and property insurance) following cessation of plant operations and during decommissioning are included and based upon current operating premiums. Reductions in premiums, throughout the decommissioning process, are based upon the guidance and the limits for coverage defined in the NRC's proposed rulemaking "Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors." The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

### Taxes

Property tax payments continue throughout the decommissioning process, although at a substantially reduced level. The rate of decrease in disbursements is consistent over the same time interval for both the DECON and SAFSTOR alternatives.

The value of plant structures and equipment decreases from 100% to 0% over an eight-year period. The property taxes are determined based on a 100% value of the plant structures and equipment for the first three years, 66.7% of the value for the next three years, 33.3% of the value for

the next three years, and 0% for the remainder of the decommissioning period.

# Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

Integrated earthworks created during the initial formation of the Lake Keowee area and integral with it will be left intact and maintained in accordance with the current dam maintenance and inspection program. The on-site dike and earthwork network forming water retention ponds and lagoons will be disabled to relieve ongoing inspection requirements.

### 3.7 COST ESTIMATE SUMMARY

Schedules of expenditures are provided in Tables 3.2 through 3.7. The tables delineate the cost contributors by year of expenditures as well as cost contributor (e.g., labor, materials, and waste disposal).

Additional tables in Appendices C and D provide detailed costs elements. The cost elements are also assigned to one of three subcategories: "License Termination," "Spent Fuel Management," and "Site Restoration." The subcategory "License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the plant's operating license, recognizing that there may be some additional cost impact from spent fuel management.

The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the pool to the DOE and the transfer of casks from the ISFSI to the DOE. Costs are also included for the operations of the pools and management of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., geologic repository) is complete.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to

appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade.

As discussed in Section 3.4.1, it is not anticipated that the DOE will accept the GTCC waste prior to completing the transfer of spent fuel. Therefore, the cost of GTCC disposal is shown in the final year of ISFSI operation (for the DECON alternative). While designated for disposal at the geologic repository along with the spent fuel, GTCC waste is still classified as low-level radioactive waste and, as such, included as a "License Termination" expense.

Decommissioning costs are reported in 2008 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure (or projected lifetime of the plant). The schedules are based upon the detailed activity costs reported in Appendices C and D, along with the timeline presented in Section 4.

TABLE 3.1 SPENT FUEL MANAGEMENT SCHEDULE

Fuel Assembly Inventory

Year	Pool	ISFSI	DOE Acceptan
2017	1271	3819	0
2018	1271	3902	53
2019	1271	3935	103
2020	1271	3931	140
2021	1271	3970	97
2022	1271	3947	159
2023	1271	3859	224
2024	1271	3593	4-02
2025	1271	3355	374
2026	1271	3170	321
2027	1271	3060	246
2028	1271	2869	327
2029	1271	2762	243
2030	1271	2717	181
2031	1271	2717	1:36
2032	1271	25 17	3\$6
2033	1365	2517	260
2034	1365	2;J:38	3līi6
2035	1261	2108	3:36
20:16	1157	1851	3)60
2037	1052	t 1599	356
2038	948	1-127	276
2039	8344	1255	276
2040	7/140	10f14	35f6
2041	6:35	94.5	16:3
2042	5311	<b>G9</b> 3	3156
2043	3:5)4	707	163
2044	177	712	172
2045	0	712	177
2046	0	510	172
2047	0	368	172
2048	0	196	172
2049	0	24	172
2050	0	0	172
Total			7,809

# TABLE 3.2 OCONEE NUCLEAR STATION, UNIT 1 DECON ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

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Year	Labor	Materials	Energy	Burial	Other	Total
2033	38,345	3,328	1,372	2,454	7,017	52,515
2034	43,351	11,930	2,264	22,487	16,517	96,550
2035	41,652	15,972	1,446	49,400	9,441	117,911
2036	26,749	6,196	1,160	9,411	6,672	50,188
2037	25,902	5,672	1,142	7,316	6,510	46,541
2038	6,478	921	387	727	2,646	11,159
2039	4,352	401	304	6	2,223	7,288
2040	4,364	403	305	6	2,229	7,308
2041	4,352	401	304	6	2,223	7,288
2042	4,352	401	304	6	2,223	7,288
2043	4,352	401	304	6	2,223	7,288
2044	4,364	403	305	6	2,229	7,308
2045	10,049	2,800	459	2,384	3,927	19,619
2046	6,575	2,445	277	120	8,702	18,119
2047	5,597	5,393	152	O	727	11,870
2048	5,613	5.408	153	O	729	11,902
2049	521	502	14	O	68	1,106
2050	0	0	0	0	11,212	11.212
	236,971	62,978	10,654	94,334	87,520	492,457

# TABLE 3.2a OCONEE NUCLEAR STATION, UNIT 1 DECON ALTERNATIVE LICENSE TERMINATION EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	37,708 <sup>1</sup>	2,362	1,372	2,454	5,965	49,861
2034	42,083	11,543	2,264	22,487	15:306	93,684
2035	39,962	10,655	1,440	49,400	8,159	114,623
2036	26,107	<b>5,92</b> 8	1,160	9,411	5,497	48,103
2037	25,315	5,408	1,142	7,3H6	5,344	44,524
2038	2,497	$\frac{5,408}{5.4}$	152	722	527	4,4:31
2039	0	0'	441	0	0,	44
2040	0	0-	44	Oi	O	44
2041	0	0;	L11411	01	O	44
2042	0	Ο,	449	О	91	44
2043	0	0	44,	O	Ŏ.	44,
2044	0	0	44	Q	<u>:</u> Ω;	44
2045	7,862	2,480	21	2,:3R],	2.674	15,419:
2046	5,317	1,196	229	120!	8,586	15.448
2047	52	0	O	0	3\661	418,
2048	52	0	O	O	<b>349</b> 7!	4120
2049	5	0	O	0	<b>H</b> -	39
2050	0	0	0	0	11,211.2	11,212
	186,961	45, 106	8,048	9/1,.289[	64.039!	398,442

# TABLE 3.2b OCONEE NUCLEAR STATION, UNIT 1 DECON ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	322	966	0	0	1,051	2,339
2034	123	368	0	O	1,166	1,657
2035	90	2691		0	1,166	1,525
2036	86	258	0	0	1,169	1.513
2037	86	257	0	O	_ 1,0661	1,508
2038	3,932	387	274	б	2.110:	0.718
2039	4,352	401	304	6	2.222)1	7,288
2040	4.364	408i	305	- 6	2.229	7.:308
2041	4,352	401	304	6	2,:222:36	7,288
2(H2	4,352	Æ∫Ql,	304	6	2,2223	7.288
2043	4,352	401	3:004	6	2.22:3	7,2H8
20-14	4,361	40.3	305	6	2.229	7.:308
20146	2,187	319,	150	Ji	1,253	3),912
20t16	720	51	31	6	107	908
20,4.7	33.147	59:	187	o	322	3, <b>G</b> 6©
2048	3,1 <b>6</b> 0	<b>59</b> :	137;	0	:12:3	3675
2049	293	6,	1:3	0	300	:3-[1
2000	0	0	0	. 0	0	0
	40,279	fi A4110):	2,571	46	231223	71,;5)28

# TABLE 3.2c OCONEE NUCLEAR STATION, UNIT 1 DECON ALTERNATIVE SITE RESTORATION EXPENDITURES

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Total	Other	Burial	Energy	Materials	Labor	Year
315	0	0	0	0	315	2033
1,209	45	0	0	19	1,145	2034
1,764	115	0	0	48	1,600	2035
572	6	0	0	10	556	2036
509	O	O	0	8	501	2037
50	0	O	0	1	49	2038
0	O	O	0	0	O	2039
0	O	O	0	0	O	2040
0	O	O	0	0	O	2041
0	O	0	0	0	0	2042
0	O	0	0	0	O	2043
0	O	O	0	0	0	2044
0	O	O	O	0	O	2045
1,749	9	O	3	1,198	539	2046
7,786	40	0	15	5.334	2,398	2047
7.808	40	O	15	5,348	2,404	2048
725	4	O	1	497	223	2049
0	O	0	0	0	0	2050
22,487	258	0	35	12,462	9,731	

# TABLE 3.3 OCONEE NUCLEAR STATION, UNIT 2 DECON ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

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Year	Labor	Materials	Energy	Burial	Other	Total
2033	8,067	761	363	652	1,753	11,596
2034	33,585	4,923	1,885	3,486	10,181	54,061
2035	41,899	16,957	1,875	47,722	12,395	120,848
2036	34,888	11,645	1,268	30,736	7,867	86,405
2037	27,692	6,364	1,142	8,638	6,456	50,292
2038	15,032	3,131	688	3,956	4,144	26,950
2039	4,353	404	304	6	2,194	7,262
2040	4,365	405	305	6	2,200	7,282
2041	4,353	404	304	6	2,194	7,262
2042	4,353	404	304	6	2,194	7,262
2043	4,353	404	304	6	2,194	7,262
2044	4,365	405	305	6	2,200	7,282
2045	10,079	2,853	459	2,506	3,836	19,732
2046	6,564	2,415	277	125	8,269	17,650
2047	5,541	5,359	152	O	727	11,780
2048	5,557	5,374	153	O	729	11,812
2049	516	499	14	0.	68	1,097
2050	0	0	0	0	11,212	11,212
	215,563	62,706	10,104	97,857	80,815	467,045

# TABLE 3.3a OCONEE NUCLEAR STATION, UNIT 2 DECON ALTERNATIVE LICENSE TERMINATION EXPENDITURES

H.O	1111	nn	ent	X-
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Total	Other	Burial	Energy	Materials	Labor	Year
11,091	1,4751	652	363	618	7,983	2033
5 L,985	9,015	3,486	U885	4,400	33,199	2034
117,487	11,154	47,722	1,875	16,646	40,089	2035
83,629	6,65§	30,736	1,268	11,358	33,611	2036
48,280	5,289	8,638	1,142	6,103	27,108	2037
22,1114	2,420	3,052	5)47	2,792	12,403	2038
46	0,	0	46	0	0	2039
46	101	0	46	0	0	2040
46	<b> 1</b> 0,	0	46	0	0	2041
1116	0	0	46	$0_{f}$	0	2042
46	- 6)	0	46	0	0	2043
46	$\mathbf{o}'$	0	46	0	0	2044
15,547	2.5971	2,503	23	2,5322	7.891	2045
14.994	K,154	125	229	1,174	5,311	2046
389	366	Ø	$0^1$	Ol	22	2047
390	3671	0	ul	0	22	2048
36	34	0	0	0	2	2049
11,212	11,212	0	0	0	0	2050
377,426	58,740	97,814	_77,607	45,624	Нј7,642	

# TABLE 3.3b OCONEE NUCLEAR STATION, UNIT 2 DECON ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES

Total	Other	Burial	Energy	Equipment & Materials	Labor	Year
ilR9	278	0	0:	143	48	2033
1,863	1,166	O	Oi	523	174	2034
1,517	1,166'.	O	Or	263	88	2035
1,511	1,169	O	<b>©</b> 4	256	85	2036
1,504	1,166	Oi	OL	254	85	2037
4,628	1,724	3:	167il-	3:35	2,400	2038
7,262	2,194	6	304	1004	4,353	2039
7,2192	2,200	6	∃Q.§j	<b>40</b> 5	4,365	2040
7,262	2,194	$6^{1}$	30/1	404	4,353	2041
7,262	2,19)1	6	3104	404	4,353	2042
_ 7,262	2,1941	6 7	3011	404	4,353	2043
7,282	2,200	<u>-6</u>	3105,	410:5	4,365	2044
3,899	1,239	a	1150,	332107	2,187	2045
9018	107	O	31	51	720	2046
3.6G5	322	0'	137	5×9	3,147	2047
33.67:)	323	O	1:37	G9	3,156	2048
341	30	O	13	G	293	2049
r	0	Ol	Ŋ	0	0	2050
67.;)91	21,RRS	43	2,162	4,693	38.526	r

# TABLE 3.3c OCONEE NUCLEAR STATION, UNIT 2 DECON ALTERNATIVE SITE RESTORATION EXPENDITURES

(thousands, 2008 dollars)

Equipment &

Total	Other	Burial	Energy	Materials	Labor	Year
36	0	0	0	0	36	2033
212	0	0	0	0	212	2034
1,845	<b>7</b> 5	0	0	48	1,722	2035
1, 26f)	41	0	0	31	1,192	2036
508	0	0	0	8	500	2037
232	0	0	0	4	229	2038
C	0	0	0	0	0	2039
9	0	0	0	O	O	2040
C	0	0	0	0	O	2041
0	0	0	0	0	O	2042
C	0	0	0	0	O	2043
0	0	0	0	0	0	2044
0	0	0	O	O,	O	2045
11,7/36	9	0	3	1,191	533	2046
7,726	40	0	15	5,300	2,372	2047
7,747	tIU	0	15	5,314	2,378	2048
720	4	O	1	494	221	2049
C	0	0	O	O	0	2050
22,027	208	0	35	12,389	9,395	

# TABLE 3.4 OCONEE NUCLEAR STATION, UNIT 3 DECON ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

H. V	1777	me	nt	X-
1,1		)        -,	111.	W.

Year	Labor	Materials	Energy	Burial	Other	Total
2034	17,163	1,468	692	1,244	3,551	24,117
2035	37,239	6,504	2,215	4,168	]4,471	64,596
2036	51,756	19,953	$1,533_{\rm f}$	64,148	10,887	148,278
2037	46,379	11,062	1,197	23,913	8.762	91,303
2038	45,043	8,997	1,142	14,:369	<b>1,427</b>	77,977
220319	13.942	2.4338	502	3.390	3.824	24,091
2040	44,367	411	3305	6.	2.412f	7,501
2041	4,355	-1109,	3104	_61	2,405	7,481
2042	4,355	409	3104	6	2,405	7,481
20t13	4U855	409	3104	<b>■</b> 6	2.40,51	7,481
20414	4,367	411	3305	6	2,4112j	7,501
20,45	151,530	3.213	4.5)9	33,09:3	4-15503\	26,799
2046	15.756	33.7759	277	152	] 1,07t8:	3311,,023
2047	17,265	10,212	152	0	1.972	29,201
2048	17.312	10,240	15)3	0	1,,\$76	29,281
20r19	4.5:)1	I, (JOG	152	0	1,054	6,763
20:30	3537	2.0164	89	2J035	1:3.498	21,222
	307.272	82,%9	10,0t86	116,;5422	96.237	<b>G</b> 12,096

# TABLE 3.4a OCONEE NUCLEAR STATION, UNIT 3 DECON ALTERNATIVE LICENSE TERMINATION EXPENDITURES

4 0	1111	mont	XT
1,1(1	un.	ment	(X

Year	Labor	Materials	Energy	Burial	Other	Total
2034	16,998	1,180	692	1,244	2,963	23,0777
2035	36,816	6,041	2,215	4,168	13,179	62,418
2036	48,260	19,587	1,533	64,148	9,495f-	143,0253
2037	44,817	10,775	1,197	23,913	7,083	87,785
2038	43,941	8,729	1,142	14,369	6,698	74,878
2039	10,353	2,057	269	3,385	1,578	17,642
2040	0	0	0	O	0	0
2041	0	0	0	0	0	0
2042	O	0	0	O	0	0
2043	0	0	0	\ •0	0	0
2044	0	0	01	10	Q	_ 0
2045	1,3.342	2,R90	309	3,000	3,07R <sub>f</sub> _	22,70Fi
2046	11,870,	1,428	24131	152	10,743	24,436
2047	22	0	Ο,	0'	822	844
2048	22 <sup>f</sup>	0	01	ရ	8244	847
2049	29	0	0,	0	7171	79
2050	0:	0	0.	Of	11.212	11,212
	226.44441	52.68(()	7,590	114.46001	67,750	468,948

# TABLE 3.4b OCONEE NUCLEAR STATION, UNIT 3 DECON ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES

77				0
H C	TTTT	me	nt	XT
1,1	11111	)	111	CV.

Total	Other	Burial	Energy	Materials	Labor	Year
972	587	0	0	288	96	2034
1,909	1,292	0	0	463	154	2035
1,639	1,295	0	0	258	86	2036
1,623	1,292	0	0	249	83.	2037
1,621	1,292	0	0	247	82	2038
6,065	2,108	5	233	371	3,348	2039
7,455	2,366	6	305	411	4,367	2040
7,435	2,360	6	304	409	4,355	2041
7,435	2,360	6	304	409	4,355	2042
7,435	2,360	6	304	409	4,355	2043
7,455	2,366	6	305	411	4,367	2044
4,048	1,384	3	150	323	2,188	2045
2,474	281	O	31	47	2,115	2046
10,204	663	O	137	43	9,361	2047
10,232	665	0	137	43	9,386	2048
4,934	910	O	151	58	3,815	2049
9,608	1,884	2,035	89	2,064	3,537	2050
92,545	25,465	2,073	2,452	6,503	56,052	

# TABLE 3.4c OCONEE NUCLEAR STATION, UNIT 3 DECON ALTERNATIVE SITE RESTORATION EXPENDITURES

Y 7			191	0
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Year	Labor	Materials	Energy	Burial	Other	Total
2034	68 <u></u>	O	0	0	0	68
2035	269	O	O	0	0	269
2036	3,409	108	O	0	97	3,614
2037	1,479	38	0	0	377	1,895
2038	1,0191	21	0	0	438	1,479
2039	24)	5	Ø	0	138-: <b>-</b>	<b>-</b> 3 <b>8</b> 3
2040		oi.	0	_ 0	4 <b>E</b> J	46
2041	0	0	0	0	45,	45
2042	0	0,	0	0	45	45
2043	, 0	O <sub>I</sub>	0	0	45∖	45
2044	U	0	0	0	461	46
2045	0	O	0	0	4P51	45
2046	1,771	2,28fJ	3	0	5§L	4,113
2047	7,882	10,169	15	0	87	18,153
2048	7,9013	10,197	15	0	87	18,203
2049	, 734	947	1	0	67	1,7/13/0
2050	. 0	0	0	. 0	403	403
	24,776	23,770	35	O	2,021	30,6003

### TABLE 3.5 OCONEE NUCLEAR STATION, UNIT 1 SAFSTOR ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

		Equipment &				
Year	Labor	Materials	Energy	Burial	Other	Total
2033	31,636	2.931	1,372	2,467	7,018	45,425
2034	22,924	4,427	1,038	790	11.2441	40,423
2035	4,367	557	304	21	_2,fi27	7,776
20:36	4,379	5591	305	2]	2,5ó1	7,797
2037	4,367	5571	:3::::03.0:4	21	2.527	7,776
20:38	4.367	557t	304	21	2,527	7,776
2039	4,367	557	304	21	2.G27	7,776
2040	4,379	\$59!	305	21	2.534	7,797
2041	4,367	5i577	304	21	2,527	7,776
2042	4,367	5>571	304	21	2,527	7.776
2043	4,367	557	304	21	2,527	7,777G
2044	4.379	550	306	21	2.634	7.797
2045	3,632	456	227	20	1,66:),	5,99t)
2040	2,917	858	152	20	822i	4,269
2047	2,917	3>5>8	152	20	822	/11,:269
2048	2,92!)	;)59	163	20	<b>R2'1</b> ,	4.280
2049	2.917	358	152	20	822.	11,,269
2050	],756	282	152	20	90:)	2,873
205il	1.663	275	1:5)2	20	649	2,748
2052	1,657	275	153	20	651	2,756
20fi3	]. <b>G</b> ,5B	275	152	20	649	2,748
2054	1,653	275	152	20	G49;	2.7/1/8
205fi	1,65)3}	275	152	20	6'19	2.748
2056	1,6;5?/1	275	153	20	651	2,756
2057	1,615:31	27/15;	1:5)2	20	649	2,748
2058	1,653	275	152	20	6419;	2.748
2059	L.Gfi3,	275!	152	20	G49	2,748
2000	1,657 <sup>t</sup>	<b>27</b> 5.	15:3	20	(151)	2,7,)6
2061	1,653	27:3 <sup>t</sup>	1;5)2	20	649	2.748
2062	1.653	275	152	20	649,	2,748
2063	1,653	<b>275</b> <sup>1</sup>	152	20	6,19:	2,748
2064	1,057	275!	153,	20	651	2,7;5)6
2065	1),353	27/51	152	20	6'19'	2,748

### TABLE 3.5 (continued) OCONEE NUCLEAR STATION, UNIT 1 SAFSTOR ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066_	1,653,	275	$152^{1}$ $152^{5}$ $152^{1}$ $152^{1}$ $152^{1}$	20'	6499L	2,748
2067	1,653	-'-'275	" $_{15}$ 521	$$ 2 $0^{1}$	643	227748
2068	1,657	2 <sub>7</sub> 75-+	<b>1</b> 53 — -	<u>2</u> 0 <sup>1</sup> <u>20</u> 1	654t	3,756
2069	1,653	275	152,	201	649.	2,748
2070	1,653	275	152	2(C)t	649 <sup>t</sup>	Z:,748
2071	1,62.3	275	152	20	649	2,7118
2072	1,657	275 <sup>1</sup>	153	<b>20</b> i	<b>651</b> 1	2,756
2073	1,653	275	162,	20	649.	
2074	1,653 <b>f</b>	<b>275</b> 275 	"-1 <u>=</u>	$= \frac{20}{20}$ c	6-4 <sub>6</sub> 45 !	$-2,\frac{2,748}{2,748}$
2075	1,6.5.3	275	152	20	649	2,7/189
2076	1,657	<b>27</b> 55-'	1538[-	201	654	2,756
2077	<b>1.6\$</b> 3	275 _	152	201	649	2,748
2078	1,653	275	11 <b>S</b> 2r	26'	649	2:748
2079	1,653	275	152	20	6419	2,748
2080	1.657	275	153	20	651	2.756
2081	1,65;)	275	152	20	649,	2,748
2082	1.65;3	275	152	20	6,19	2,718
2086	1,653	275	152	20	649:	2,748
2084	1.65)7	276	153	201	651	2.756
2085	1,653	275	153 1'=5 <sub>1-\(\frac{1}{5}\)'2t[</sub>	'20 <sub>20</sub> 1-	64!3	- <del>2</del> .748
2086	26,463.	1,470	1,398	26	4282i	33.630
2087	33,504	9,8:33	1,491	21.5633	8,943	75,335
<b>208</b> 8	34,727	14,08/4	1,366.	41,541B:	13,7671	105,486
2089	25,376	6,6120	1,142	12.5773!	5,241	50,852
2090	1,089	175	13	14:31	364	11,1784
2091	820 <sup>1</sup>	105	0	5:	310	1,241
2092	4,601	985	1999!	1§L_	7,21131	13,015
2093	5,6992.	4.961	167	2'	1.:3791	12.200
2094	5,596	5,334,	152	0	374!	11,466
2095	2,330	2,221	63	OJ	106	4.771
"1	3,183,404	70,416	<b></b>	80,149	11:3,936:	595,675

### TABLE 3.5a OCONEE NUCLEAR STATION, UNIT 1 SAFSTOR ALTERNATIVE LICENSE TERMINATION EXPENSITURES

Equipment &	Z	
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Year	Labor	Materials	Energy	Burial	Other	Total
2033	31,313	1,961	1,372	2,467	5,967	43,080
2034	21,760	4,063	978	790	9,803	37,393
2035	1,653	286	152	21	670	2,782
2036	1,657	287	153	21	672	2,789
2037	1,653	286	152	21	670	2,782
2038	1,653	286	152	21	670	2,782
2039	1,653	286	152	21	670	2,782
2040	1,657	287	153	21	672	2,789
2041	1,653	286	152	21	670	2,782
2042	1,653	286	152	21	670	2,782
2043	1,653	286	152	21	670	2,782
2044	1,657	287	153	21	672	2,789
2045	1,653	284	152	20	670	2,779
2046	1,653	281	152	20	670	2,777
2047	1,653	281	152	20	670	2,777
2048	1,657	282	153	20	672	2,784
2049	1,653	281	152	20	670	2,777
2050	1,653	275	152	20	651	2,751
2051	1,653	275	152	20	649	2,748
2052	1,657	275	153	20	651	2,756
2053	1,653	275	152	20	649	2,748
2054	1,653	275	152	20	649	2,748
2055	1,653	275	152	20	649	2,748
2056	1,657	275	153	20	651	2,756
2057	1,653	275	152	20	649	2,748
2058	1,653	275	152	20	649	2,748
2059	1.653	275	152	20	649	2,748
2060	1,657	275	153	20	651	2,756
2061	1,653	275	152	20	649	2,748
2062	1,653	275	152	20	649	2,748
2063	1,653	275	152	20	649	2,748
2064	1,657	275	153	20	651	2,756
2065	1,653	275	152	20	649	2,748

## TABLE 3.5a (continued) OCONEE NUCLEAR STATION, UNIT 1 SAFSTOR ALTERNATIVE LICENSE TERMINATION EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	1,653	275	152	20	649	2,748
2067	1,653	275	152	20	649	2,748
2068	1,657	275	153	20	651	2,756
2069	1,6.53	275	152	20	649	2)748
2070	1,653	- <u>-</u> - 275)	- 162	20	049	227.488
2071	1,653	275	152	20	649	2,748
2072	1,657	27/51	153	20	651	2,756
2073	1,653	275	152	20	649	2,748
2074	1,653	275,	152	20	649'	2,748
2075	-1,653		15251	204	649	2,748
2076	1,657	275	1;531	<sub>20:</sub> t	651	2,756
2077	1,653	275	152	20	649:	2,748
2078	1,6133	275 <sup>f</sup>	1521	20	649.	2,748
2079	1,653 <sup>1</sup>	275	152	201	649	2,748
2080	1,657	275	153	2/0	661	2.7/G/G
2081	1,05;3	275	152	2/0; 200	649	2,748
2082	1,65:3	_2750	152	<b>20</b> r	649	_2,748
2083	1,653_	27/51	152	$20^{1}$	6c19	2,7//48
2084	1,657	275	153	204	661	2,756
2085	1,653	275	152	20	649	2,748
2086	263,126	1,470	1,:398	20 26	4.282	33,302
2087	31,980	9,810	1,4911	21 ) [3]	8.9413	73.787
2088	3;3,0;36	14,0391	1,366	41,543,	13,766:	103,750
2089	24.578	6, 607	1.142	12.573	5⊳241i	50,042
2090	1,081	175,	13	143,	3 <b>G</b> 4	1,776
2091	820	1051	0	51	310	1,241
2092	11,601	9 <b>8</b> G!	A99,	161	7,2113)	13,015
2093	696	139	29 <sub>29</sub>	2f	U372	2,238
2094	71	0r	0	<b>Q</b> f	366:	4:37
2095	29	01	oj	01,	152	182
	260,429	ā3.42.1,	=-45 <b>.,7.</b> 117L	80,149	9 <sub>11</sub> , <u>2</u> 33 <u>i</u>	500,989

### TABLE 3.5b OCONEE NUCLEAR STATION, UNIT 1 SAFSTOR ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES

17			141	0
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	u	DILL	CIII	· CC

Year	Labor	Materials	Energy	Burial	Other	Total
2033	323	970	0	O	1,051	2,345
2034	1,164	365	60	0	1,440	3,030
2035	2,714	272	152	O	1,857	4,995
2036	2,722	272	153	0	1,862	5,008
2037	2,714	272	152	0	1,857	4,995
2038	2,714	272	152	0	1,857	4,995
2039	2,714	272	152	0	1,857	4,995
2040	2,722	272	153	0	1,862	5,008
2041	2,714	272	152	0	1,857	4,995
2042	2,714	272	152	0	1,857	4,995
2043	2,714	272	152	0	1,857	4,995
2044	2,722	272	153	0	1,862	5,008
2045	1,979	173	75	0	992	3,219
2046	1,264	76	0	0	151	1,492
2047	1,264	76	0	0	151	1,492
2048	1,268	76	O	0	152	1.496
2049	1,264	76	0	0	151	1,492
2050	104	6	0	0	12	123
2051	0	O	0	0	O	0
2052	0	0	0	0	O	0
2053	0	0	0	0	0	0
2054	0	0	0	O	0	0
2055	0	0	0	O	0	0
2056	0	0:	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0:	0	0	0	0
2059	0	0	0	0	O	0
2060	0	0.	0	0	O	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	O	0
2065	0	0	0	0	0	0

### TABLE 3.5b (continued) OCONEE NUCLEAR STATION, UNIT 1 SAFSTOR ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	0	0	O	0	0	0
<u>2067</u>	0	0	0	0	0	0-
2068	0	01	0	0	0.	0
2069	0	0	0	0	8	0
2070	<b>Q</b>	<b>o</b> <sup>1</sup>	0	0	0	01
2071 -	0	0	0	0	,91	
$2\overline{0}7\overline{2}$	0	0	61	0	01	0
2073	0	0	0,	0	01	0
2074	_ 0	. OJ	0	0	01	0
2075	0	0	0,	0	0,	0
2076	Q	0	0	61	0	0
20077	0	0	O	ο <sup>†</sup>	<b>Ø</b> 1	0'
2078	0	0	0'	0,	8	6
2079	O	0	O	O		0'
2080	0	0	0	0.	01	0,
2081	0	0	O	0	01	9,
2082	0	0	0.	01	0	6,
2083	0	0	0	$\mathbf{O}_1$	01	0:
2084	0	0	O	9'	0	0'
2085	0	0	0	$\mathbf{O}_1$	d	0'
2086	0	0	0	0:	o',	0:
2087	0	0	0	O!	01	0,
2088	0	0	0	<b>9</b> j	0'1	0,
2089	0	0	0	$\mathbf{O}_1$		0:
2090	O	0	0	0	of	0,
2091	0	0	0	0	0	
2092	O	0	O	O	0	6
W- <del>2</del> 09.33=		0	0	0	0	0
2094	0	0	O,	o	0'	0
2095	. 0	0	0	100	. 0	0
annie	35,795	4,537	1,659	0	22,684	64,671)]

### TABLE 3.5c OCONEE NUCLEAR STATION, UNIT 1 SAFSTOR ALTERNATIVE SITE RESTORATION EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	0	0	0	0	0	0
2034	0	0	O	0	O	0
2035	0	0	O	0	O	0
2036	0	0	0	O	0	0
2037	O	0	0	O	O	0
2038	O	0	0	0	O	0
2039	0	0	0	O	0	0
2040	0	0	0	0	0	0
2041	O	0	O	O	O	0
2042	O	0	O	0	O	0
2043	0	0	0	0	O	0
2044	0	0	О	0	0	0
2045	O	0	0	O	O	0
2046	O	0	0	O	0	0
2047	0	0	0	0	0	0
2048	O	0	O	O	0	0
2049	O	0	0	0	O	0
2050	O	0	0	O	O	0
2051	O	0	0	0	O	0
2052	O	0	0	O	O	0
2053	O	01	0	0,	0	0
205/1	0	01	0	Oī	ø	0
2055	O	Or	0	or	0	0
2056	0	01	0	0t-	O	0
20fi7	0	01	0	01	O	0
2058	0	01	0	0_	0	0
2059	a	0	O	6	О,	0
20G0	0	0	0	O	0:	0
2061	0	0	0	O	0:	0
2062	0	0'	0	O	n	0
2063	O	0	0	0	OJ	0
2064	O	0	0	O	0'	0
20G5	0	0:	O	O	Oʻ	0

### TABLE 3.5c (continued) OCONEE NUCLEAR STATION, UNIT 1 SAFSTOR ALTERNATIVE SITE RESTORATION EXPENDITURES

**	Υ 1	Equipment &		D : 1	0.1	m . i
Year	Labor	Materials	Energy	Burial	Other	Total
2066	0	0	0	0	0,	0
2067	0	0,	0 .	Q	01	. 1 9
2068	0	0	0 1	o	'01	0;
2069	_ 0	<del>9</del> j	a	0	ol	0; 0;
2070	0	Ŏ,	O	0	0	0:
2071	0,	0:	0	0	0	0
2072	0	01	O	O	O	0
207.3	0	0	0,	0	OI <sub>I</sub>	0
2074	0	0; 0,	0	0	Qi	0;
2075	2	0	ø	0	6)	6
2076		0,	at Or	0	0'	0
2077 —		<b>-</b> 0t	θ <u>I</u> _	0	O	0
2078	0	0	0.	= $=$ $0$	01	0
2079	. 61	0	0'	0	Q	. 0
2080	0	0	0,	0	01	0
2081	O'	0	0,	0	O	0
2082	O.	Ø	O	0	0'	0
2083	0	0	0	0	0:	. 0
2084	01	0	0	0	0	0
2085	0	0	0	0	0	0
20R6	3B 7	0	0	0	0	337
2087	1,524	24	0	0	<b>O</b> :	1,547
2088	1.691	1.3	O	_ 0_	1	1.736
2089	798∖	13	0	0	0	810,
2090	91	0'	0	0	O	9
2091	О,	0_	0	0	0,	0
2092	0	0	0	01	r Q,	O
2093	4.996	4.822	138	0	. 7	9.963
2094	5,525	5,334	152,	0	8	11,019
2095	2,301	2,221	63	0	3	4,589
	17,180	12.458	353	0	19	30,011

### TABLE 3.6 OCONEE NUCLEAR STATION, UNIT 2 SAFSTOR ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	6,676	653	363	652	1,668	10,012
2034	28,868	4,737	1,522	2,313	12,159	49,599
2035	10,655	1,604	628	294	3,904	17,086
2036	4,377	558	305	21	2,454	7,715
2037	4,365	556	304	21	2,447	7,694
2038	4,365	556	304	21	2,447	7,694
2039	4,365	556	304	21	2,447	7,694
2040	4,377	558	305	21	2,454	7,715
2041	4,365	556	304	21	2,447	7,694
2042	4,365	556	304	21	2,447	7,694
2043	4,365	556	304	21	2,447	7,694
2044	4,377	558	305	21	2,454	7,715
2045	2,790	450	227	20	1,523	5,010
2046	1,258	346	152	19	624	2,399
2047	1,258	346	152	19	624	2,399
2048	1,261	347	153	20	626	2,406
2049	1,258	346	152	19	624	2,399
2050	1,010	276	152	19	572	2,030
2051	988	270	152	19	568	1,997
2052	991	271	153	20	569	2,003
2053	988	270	152	19	568	1,997
2054	988	270	152	19	568	1,997
2055	988	270	152	19	568	1,997
2056	991	271	153	20	569	2,008
2057	988	270	152	19	568	1,997
2058	988	270	152	19	568	1,997
2059	988	270	152	19	568	1,997
2060	991	271	153	20	569	2,003
2061	988	270	152	19	568	1,997
2062	988	270	152	19	568	1,997
2063	988	270	152	19	568	1,997
2064	991	271	153	20	569	2,003
2065	988	270	152	19	568	1,997

## TABLE 3.6 (comtinued) OCONEE NUCLEAR STATION, UNIT 2 SAFSTOR ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	988	270	152	19	<b>5</b> 68	1,997
2067	988	<b>'27</b> 0	152	19	568	1.997
2068	991	271	153.	20	569	2,002
2069	988	270.	15)2)	19	568	1,997
2070	988	270	152	19	568	1.99
2071	<b>98</b> 8	279r	152	19	568	1,99
2072	991	271	153	20	569	2,002
2073	988	270:	162	19	568	1,99
2074	988	270	152	19	568,	1,99
2075	988	270:	152	19	56f	1,997
2076	991	271	163	20	569	2,00;
2077	988	270	1521	19	5681	1,99
2078	988;	270	$152_{1}^{\prime}$	19	568	1.99
2079	988	270	1;52:	19	<b>5)68</b> :	1,99
2080	901	271	15:3	20	560	2,00
2081	988	270	15'2:	19	568'	1,99
20)0,2	988	270	152	19	56%	1,99
2083	988	270	152	19	568	1,99
2084	091	271	15:%	20	569	2,00)
2085	988	270	L)2.	19	568	1.99
2086	988	<b>PTO</b>	152:	19	568	1,99
2087	16,046	1.265	1.207	24	2.367	20,90
2088	26,29)1	8,633	1,506	18.013	7,352	61,79
2089	35,977	1 G,A69;	1,138	46.961	14,598	114,34
2090	25,968	6,7775)		113, 128	5,063	52,07
2091	1.901	nd	53	616	<u> R</u> 19	3.59
2092	4,601	9641	1991¹	16	6,835	12,61
2093	5,6;31	41,027	1671	2	1.3,24	12,055
2094	5,5301	5.300:	152	O	374	11,356
2095	2,3031	2,207	63	0	11'919	4,72
	254,293	69,797	17,556	83.024	103.404	528.074

#### TABLE 3.6a OCONEE NUCLEAR STATION, UNIT 2 SAFSTOR ALTERNATIVE LICENSE TERMINATION EXPENDITURES

H'ON	1110	ma	nt	Xx
Egr			111.	CV.

Year	Labor	Materials	Energy	Burial	Other	Total
2033	6,629	510	363	652	1,390	9,543
2034	28,692	4,209	1,522	2,313	10,992	47,729
2035	8,153	1,336	516	294	2,221	12,520
2036	991	286	153	21	578	2,029
2037	988	285	152	21	577	2,023
2038	988	285	152	21	577	2,023
2039	988	285	152	21	577	2,023
2040	991	286	153	21	578	2,029
2041	988	285	152	21	577	2,023
2042	988	285	152	21	577	2,023
2043	988	285	152	21	577	2,023
2044	991	286	153	21	578	2,029
2045	988	278	152	20	577	2,015
2046	988	270	152	19	577	2,006
2047	988	270	152	19	577	2,006
2048	991	271	153	20	578	2,012
2049	988	270	152	19	577	2,006
2050	988	270	152	19	568	1,998
2051	988	270	152	19	568	1,997
2052	991	271	153	20	569	2,003
2053	988	270	152	19	568	1,997
2054	988	270.	152	19	568	1,997
2055	988	270	152	19	568	1,997
2056	991	271	153	20	569	2,003
2057	988	270	152	19	568	1,997
2058	988	270	152	19	568	1,997
2059	988	270	152	19	568	1,997
2060	991	271	153	20	569	2,003
2061	988	270	152	19	568	1,997
2062	988	270	152	19	568	1,997
2063	988	270	152	19	568	1,997
2064	991	271	153	20	569	2,003
2065	988	270	152	19	568	1,997

### TABLE 3.6a (continued) OCONEE NUCLEAR STATION, UNIT 2 SAFSTOR ALTERNATIVE LICENSE TERMINATION EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	988	270	152	19	568	1,997
2067	988	270	152	19	568	1,997
2068	991	271	153	20	569	2,003
2069	988	270	152	19	568	1,997
2070	988	270	152	19	568	1,997
2071	988	270	152	19	568	1,997
2072	991	271	153	20	569	2,003
2073	988	270	152	19	568	1,997
2074	988	270	152	19	568	1,997
2075	988	270	152	19	568	1,997
2076	991	271	153	20	569	2,003
2077	988	270	152	19	568	1,997
2078	988	270	152	19	568	1,997
2079	988	270	152	19	568	1,997
2080	991	271	153	20	569	2,003
2081	988	270	152	19	568	1,997
2082	988	270	152	19	568	1,997
2083	988	270	152	19	568	1,997
2084	991	271	153	20	569	2,003
2085	988	270	152	19	568	1,997
2086	988	270	152	19	568	1,997
2087	15,924	1,265	1,207	24	2,367	20.783
2088	25,228	8,614	1,506	18,013	7,352	60,712
2089	33,958	15,415	1,338	46,961	14.597	112,269
2090	25,232	6,763	1,142	13,128	5,063	51,328
2091	1,957	415	53	616	519	3,561
2092	4,601	964	199	16	6,835	12,616
2093	659	136	29	2	1,317	2,143
2094	30	O	0	0	366	396
2095	13	0	0	0	152	165
	2011,f>077	53,549	15,64441	83.024	82,269	435,993

### TABLE 3.6b OCONEE NUCLEAR STATION, UNIT 2 SAFSTOR ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	48	143	0	0	278	469
2034	176	528	0	O	1,166	1,870
2035	2,503	268	112	0	1,683	4,566
2036	3,386	272	153	0	1,876	5,686
2037	3,377	271	152	0	1,870	5,671
2038	3,377	271	152	0	1,870	5,671
2039	3,377	271	152	O	1,870	5,671
2040	3,386	272	153	O	1,876	5,686
2041	3,377	271	152	O	1,870	5,671
2042	3,377	271	152	O	1,870	5,671
2043	3,377	271	152	O	1,870	5,671
2044	3,386	272	153	0	1,876	5,686
2045	1,802	172	75	0	946	2,996
2046	269	76	0	0	47	393
2047	269	76	0	O	47	398
2048	270	76	0	0	47	394
2049	269	76	0	0	47	393
2050	22	6	0	0	4	32
2051	0	0	0	0	O:	(
2052	O	0	O	O	0	(
2053	0.	0	0	0	O:	C
2054	0	0.	O	O	O	C
2055	0	0	0	0	O	(
2056	0	0	0	0	O	(
2057	0	0	0	0	O	(
2058	0	0	O	O	O	(
2059	O	0	0	0	0	C
2060	0	0	0	O	O	0
2061	0	0	O	0	0	0
2062	0	0	0	0	O	0
2063	O	O	O	0	0	C
2064	0	0	0	0	0	0
2065	O,	0	O	O	O	0

# TABLE 3.6b (continued) OCONEE NUCLEAR STATION, UNIT 2 SAFSTOR ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES (thousands, 2008 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	0	<u> </u>	Oi <sub>1</sub>	0	0	0:
2067	0	at	01	0	O	0:
2068	0	0	91	0	OJ	0:
2069	0	0:	0	0	0	0
2070	0	OL:	0	0	0'	Q
2071	0	0	O:	0	0,	0:
2072	0	Ol	01	0	0	0
2073	0	$\mathbf{O}_1$	0	0	0	0:
2074	0	01	0	0	Ot	0:
2075	0	<u>Q</u> r_	0	0	On	0
2076	0	0,	0	0	0,	0:
2077	0	O,	0	0	Oi	0
2078	0	0	91	0	0'	ō
2079	0	0	Oi	0	01, _	0
2080	0	0	0	0	0:	0.
2081	0	0	0	o <sup>'</sup>	0,	0
2082	0	0	0	0	of	0
2083	0	0.	O	0	01	0
2084	0	0	0	O	oi	9
2085	0	0	0	0	ot	0
2086	0	0.	0	0	0:	0
2087	0	0	0	0	O)	0
2088	0	0'	0	O	Ol	0
2089	O	0!	0	0	o!	0
2090	0	Q;	0	0	$o^1$	0
2091	0	0	0	0	0	0
2092	O	QJ	0	0:	0]	Q
2093	0	0,	0	0'	of	0
2094	0	0:	0	O <sub>i</sub>	0	0
2095	0	01	0	0,	0	0
	36,051	3,862	1.5G8	0	2111(1)(1)	<u>62,588</u>

#### TABLE 3.6c OCONEE NUCLEAR STATION, UNIT 2 SAFSTOR ALTERNATIVE SITE RESTORATION EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	0	0	0	0	0	C
2034	0	0	0	0	0	0
2035	O	0	O	O	O	0
2036	O	0	O	0	O	0
2037	0	0	0	0	O	0
2038	0	0	0	0	O	0
2039	O	0	O	O	O	0
2040	O	0	0	0	0	0
2041	O	0	O	O	O	0
2042	0	0	0	O	0	0
2043	0	0	0	0	0	0
2044	0	0	O	0	O	C
2045	0	0	0	0	0	0
2046	0	0	0	0	0	0
2047	O	0	0	0	0	0
2048	0	0	0	0	0	0
2049	O	0	0	O	0	0
2050	0	0	0	0	O	C
2051	0	0	O	0	0	C
2052	O	0	O	O	0	0
2053	O	0	0	O	0	0
2054	0	0	0	O	0	0
2055	O	0	O	0	0	0
2056	O	0	0	O	0	0
2057	0	0	O	0	0	0
2058	0	0	O	O	0	0
2059	0	0	O	O	O	0
2060	0	0	0	0	0	0
2061	0	0	0	O	0	0
2062	0	0	O	0	0	0
2063	0	0	O	0	0	0
2064	0	0	O	0	0	0
2065	0	0	0	0	0	0

### TABLE 3.6c (continued) OCONEE NUCLEAR STATION, UNIT 2 SAFSTOR ALTERNATIVE SITE RESTORATION EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	O	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	O	0	0
2073	0	0	0	0	O	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	O	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	0	0	O	0	O	0
2080	0	0	0	0	0	0
2081	0	0	O	O	O	0
2082	0	0	O	O	O	0
2083	0	0	O	O	O	0
2084	0	0	0	0	O	0
2085	0	0	0	0	O	0
2086	0	0	0	0	0	.0
2087	122	0	O	0	0	122
2088	1,066	21	O	0	O	1,088
2089	2,019	54	O	0	O	2,073
2090	732	12	O	O	O	744
2091	34	1	O	0	O	35
2092	0	0	O	O	0	0
2093	4,972	4,791	138	0	7	9,908
2094	5,499	5,300	152	0	8	10,959
2095	2,290	2,207	63	0	3	4,564
	16,735	<b>12</b> ,385	3.5.31	Q	19	29, 1922

### TABLE 3.7 OCONEE NUCLEAR STATION, UNIT 3 SAFSTOR ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	14,510	1,023	692	1,244	3,647	21,116
2035	33,652	5,583	1,522	2,036	14,987	57,780
2036	5,754	751	365	79	2,924	9,873
2037	4,394	567	304	21	2,68]	7,966
2038	4,394	567	304	21	2,68	_,7,990610
2039	4,394	567	304	21	2,G81	7,966
2040	4,406	568	305	21	2.6H8'	7,988
2041	4,394	567	304	21	2.681	7.966
2042	4,394	567	304	21	2,6\$1	7,966
20014.38	41394	567	304	21	2.681	7.966
2044	4,406	568	305	21	2,fi8K	7,988
2045	2.819	462	227	20	1.7;5f)	5)288
2046	1,287	359	152	19	8)544	2,673
2047	1,287	359	152	19	854	2,673
2048	1,290	360	153	20	<b>H</b> 5i	2,680
2UV9	1,2R7	359	152	19	Kf5i1	2,86%
2050	1.0:38	286	152	19	596	2,092
20G1	1,0161	279	152	19	67;3	2.0 W
2082	1.019	280	153	20	57!)	2,046
2WG:3	1,,016	279	152	19	67:3	2.040
2084	11,,00] 6t	279	152	19	G7:3	2,040
2055	1,016	279	152	19	G78	2,040
201)6	1:0191	280	153	20	57/G	2,046
2067	1,016	279	152	19	573)	2,0'40
201)8	11,9018-	279	152	19	57:3	2,040
2059	1,016	279	152	19	57:31	2,()110
2060	1,019	280	153	20	575	2.0/16
2061	1.016	279	152	19	577:3.	2,040
2062	1,016	279	152	19	5 T:):	2,040
206:3	1.016	279	152	19	5)7:3j	2.040
2064	1,019	280	153	20	G7G,	2,0146
2065	1,016	279	152	19	573	2,040
2066	1,016	279	152	19	573	2,0-10

### TABLE 3.7 (continued) OCONEE NUCLEAR STATION, UNIT 3 SAFSTOR ALTERNATIVE SCHEDULE OF TOTAL ANNUAL EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2067	1,016	279	152	19	573	2,040
2068	1,019	280	153	20	575	2,046
2069	1,016	279	152	19	573	2,040
2070	1,016	279	152	19	573	2,040
2071	1,016	279	152	19	573	2,040
2072	1,019	280	153	20	575	2,046
2073	1,016	279	152	19	573	2,040
2074	1,016	279	152	19	573	2,040
2075	1,016	279	152	19	573	2,040
2076	1,019	280	153	20	575	2,046
2077	1,016	279	152	19	573	2,040
2078	1,016	279	152	19	573	2,040
2079	1,016	279	152	19	573	2,040
2080	1,019	280	153	20	575	2,046
2081	1,016	279	152	19	573	2,040
2082	1,016	279	152	19	573	2,040
2083	1,016	279	152	19	573	2,040
2084	1,019	280	153	20	575	2,046
2085	1,016	279	152	19	573	2,040
2086	1,016	279	152	19	573	2,040
2087	1,016	279	152	19	573	2,040
2088	19,677	1,373	1,320	25	2,562	24,956
2089	31,436	10,536	1,495	24,861	8,770	77,098
2090	44,059	15,975	1,314	47,328	14,241	122,916
2091	40,012	8,867	1,142	17,574	6,658	74,253
2092	22,372	4,218	597	6,131	11,160	44,478
2093	14,730	9,679	167	2	1,977	26,555
2094	14,923	10,522	152	0	754	26,351
2095	6,215	4,382	63	0	314	10,974
1	329.144	89,969).	17,892	100.2822	116,4500	653.737

### TABLE 3.7a OCONEE NUCLEAR STATION, UNIT 3 SAFSTOR ALTERNATIVE LICENSE TERMINATION EXPENDITURES

1 7				14	0
Eq	1771	nw	20	nt	X-
17(1	un		16	111	CV

Year	Labor	Materials	Energy	Burial	Other	Total
2034	14,414	734	692	1,244	2,650	19,735
2035	33,498	5,120	1,522	2,036	13,183	55,360
2036	2,529	479	220	79	858	4,165
2037	1,016	295	152	21	582	2,066
2038	1,016	295	152	21	582	2,066
2039	1,016	295	152	21	582	2,066
2040	1,019	296	153	21	584	2,072
2041	1,016	295	152	21	582	2,066
2042	1,016	295	152	21	582	2,066
2043	1,016	295	152	21	582	2,066
2044	1,019	296	153	21	584	2,072
2045	1,016	287	152	20	582	2,058
2046	1,016	279	152	19	582	2,049
2047	1,016	279	152	19	582	2,049
2048	1,019	280	153	20	584	2,055
2049	1,016	279	152	19	582	2,049
2050	1,016	279	152	19	574	2,041
2051	1,016	279	152	19	573	2,040
2052	1,019	280	153	20	575	2,046
2053	1,016	279	152	19	573	2,040
2054	1,016	279	152	19	573	2,040
2055	1,016	279	152	19	573	2,040
2056	1,019	280	153	20	575	2,046
2057	1,016	279	152	19	573	2,040
2058	1,016	279	152	19	573	2,040
2059	1,016	279	152	19	573	2,040
2060	1,019	280	153	20	575	2,046
2061	1,016	279	152	19	573	2,040
2062	1,016	279	152	19	573	2,040
2063	1,016	279	152	19	573	2,040
2064	1,019	280	153	20	575	2,046
2065	1,016	279	152	19	573	2,040
2066	1,016	279	152	19	573	2,040

### TABLE 3.7a (continued) OCONEE NUCLEAR STATION, UNIT 3 SAFSTOR ALTERNATIVE LICENSE TERMINATION EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2067	1,016	279	152	19	573	2,040
2068	1,019	280	153	20	575	2,046
2069	1,016	279	152	19	573	2,040
2070	1,016	279	152	19	573	2,040
2071	1,016	279	152	19	573	2,040
2072	1,019	280	153	20	575	2,046
2073	1,016	279	152	19	573	2,040
2074	1,016	279	152	19	573	2,040
2075	1,016	279	152	19	573	2,040
2076	1,019	280	153	20	575	2,046
2077	1,016	279	152	19	573	2,040
2078	1,016	279	152	19	573	2,040
2079	1,016	279	152	19	573	2,040
2080	1,019	280	153	20	575	2,046
2081	1,016	279	152	19	573	2,040
2082	1,016	279	152	19	573	2,040
2083	1,016	279	152	19	573	2,040
2084	1,019	280	153	20	575	2,046
2085	1,016	279	152	19	573	2,040
2086	1,016	279	152	19	573	2,040
2087	1,016	279	152	19	573	2,040
2088	19,542	1,373	1,320	25	2,562	24,821
2089	29,579	10,488	1,495	24.861	8,770	75,192
2090	40,518	15,704	1,314	46,831	13,863	118,229
2091	37,574	8,420	1,142	16,434	5,792	69,362
2092	21,524	4,063	597	5,734	10,859	42,776
2093	1,265	166	29	2	1,951	3,413
2094	30	0	0	0	725	755
2095	13	O	0	O	302	315
	252,342	60,927	16,100	913.2471	90.8881	518,5044

### TABLE 3.7b OCONEE NUCLEAR STATION, UNIT 3 SAFSTOR ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES

Eq	ui	pm	en	t	&

Year	Labor	Materials	Energy	Burial	Other	Total
2034	96	288	0	0	587	972
2035	154	463	O	0	1,292	1,909
2036	3,224	272	145	0	2,021	5,663
2037	3,378	272	152	O	2,053	5,855
2038	3,378	272	152	O	2,053	5,855
2039	3,378	272	152	0	2,053	5,855
2040	3,387	273	153	0	2,059	5,871
2041	3,378	272	152	O	2,053	5,855
2042	3,378	272	152	O	2,053	5,855
2043	3,378	272	152	0	2,053	5,855
2044	3,387	273	153	O	2,059	5,871
2045	1,803	175	75	0	1,100	3,153
2046	271	80	O	O	173	524
2047	271	80	0	0	173	524
2048	272	80	O	0	173	525
2049	271	80	O	O	173	524
2050	22	7	0	0	14	43
2051	0	0	0	O	O	0
2052	O	0	O	O	0	0
2053	0	0	0	0	O	0
2054	0	0	0	0	0	0
2055	0	0	O	O	0,	0
2056	0	0	0	0	0	0
2057	O	O	O	0	O	0
2058	0	0	0	0	0	0
2059	O.	O	O	0	O	0
2060	0	0	O	0	0	0
2061	O	0	O	O	O	0
2062	0	0	O	O	0	0
2063	0	0	O	0	O	0
2064	0	0	0	0	0	0
2065	O	0	O	0	0	0
2066	0	0	0	0	0	0

### TABLE 3.7b (continued) OCONEE NUCLEAR STATION, UNIT 3 SAFSTOR ALTERNATIVE SPENT FUEL MANAGEMENT EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2067	0	0	0	0	O	0
2068	0	0	0	0	O	0
2069	0	0	0	0	O	0
2070	0	0	0	0	O	0
2071	0	0	O	0	O	0
2072	0	0	O	O	O	0
2073	0	O	0	0	O	0
2074	0	0	O	0	0	0
2075	0	0	0	0	O	.0
2076	0	0	O	O	0	0
2077	0	0	O	O	0	0
2078	O	0	O	O	0	0
2079	O	0	0	0	0	C
2080	0	0	0	O	0	0
2081	0	0	0	0	O	C
2082	O	0	O	0	O	C
2083	0	0	0	0	0	C
2084	0	0	O	O	O	C
2085	0	0	O	O	0	C
2086	Ol	0	0	0	O	C
2087	O:	0	O	0	0	0
2088	0	0	0	0	0	C
2089	O	0	O	0	0	C
2090	550	184	O	497	377	1,608
2091	1,263	423	O	1,141	866	3,692
2092	439	147	O	397	301	1,285
2093	127	316	O	0	18	461
2094	140	350	O	0	19	510
2095	58	146	0	O	8	212
**************************************	36.001	5,269	1,439	Z,03!5,	23,720	68,41733

### TABLE 3.7c OCONEE NUCLEAR STATION, UNIT 3 SAFSTOR ALTERNATIVE SITE RESTORATION EXPENDITURES

Ľq	U1	pm	ie:	nt	œ	

Year	Labor	Materials	Energy	Burial	Other	Total
2034	0	0	0	0	409	409
2035	0	0	0	0	512	512
2036	0	0	0	0	46	46
2037	0	O	0	0	45	45
2038	0	0	0	0	45	45
2039	0	0	0	0	45	45
2040	0	0	0	0	46	46
2041	0	O	0	0	45	45
2042	0	0	0	0	45	45
2043	O	0	0	0	45	45
2044	0	0	0	0	46	46
2045	0	O	0	0	73	73
2046	0	0	0	0	100	100
2047	0	O	0	.0	100	100
2048	0	0	0	0	100	100
2049	0	0	0	0	100	100
2050	0	O	0	0	8	8
2051	O	O	0	O	O	0
2052	0	0	0	0	O	0
2053	O	0	0	0	O	0
2054	0	0	0	0	0	0
2055	0	0	0	0	O	0
2056	0	0	0	0	0	0
2057	0	0	O	0	O	0
2058	O	0	O	0	O	0
2059	0	0	0	0	O	0
2060	0	0	0	0	O	0
2061	0	0	0	0	O	0
2062	0	0	0	0	O	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	O	0	O	O	0

### TABLE 3.7c (continued) OCONEE NUCLEAR STATION, UNIT 3 SAFSTOR ALTERNATIVE SITE RESTORATION EXPENDITURES

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2067	0	O	0	0	0	0
2068	0	0	0	0	O	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	O	0	O	0
2074	0	0	0	0	O	0
2075	O	0	0	0	0	0
2076	0	0	0	0	O	0
2077	0	0	0	0	O	0
2078	0	0	O	O	O	0
2079	0	0	0	0	O	0
2080	O	O	O	O	O	0
2081	0	0	0	0	0	0
2082	O	O	0	0	O	0
2083	O	O	O	0	O	0
2084	0	0	0	O	O	0
2085	0	0	0	0	O	0
2086	0	0	O	0	O	0
2087	O	0	O	0	O	0
2088	135	0	O	0	0	135
2089	1,858	48	O	O	0	1,906
2090	2,991	87	O	0	O	3,079
2091	1,174	24	0	0	O	1,199
2092	409	8	0	0	0	417
2093	13,338	9,197	138	O	9	22,681
2094	14,753	10,172	152	0	9	25,086
2095	6,144	4,236	63	0	4	10,447
	40,801	23,772	353	0	1,833	66,760

#### 4. SCHEDULE ESTIMATE

The schedules for the decommissioning scenarios considered in this study follow the sequences presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plan described in Section 3.5.1.

A schedule or sequence of activities for the DECON alternative from shutdown through ISFSI restoration is presented in Figure 4.1. The scheduling sequence is based on the fuel being removed from the spent fuel pools within twelve years. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project Professional 2003" computer software. [29]

#### 4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual man-hour estimates from the cost table, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the decommissioning schedule:

- The Fuel Building is isolated until such time that all spent fuel has been discharged from the spent fuel pools to the DOE. Decontamination and dismantling of the storage pools is initiated once the transfer of spent fuel is complete (DECON option).
- All work (except vessel and internals removal) is performed during an 8-hour workday, 5 days per week, with no overtime. There are eleven paid holidays per year.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.

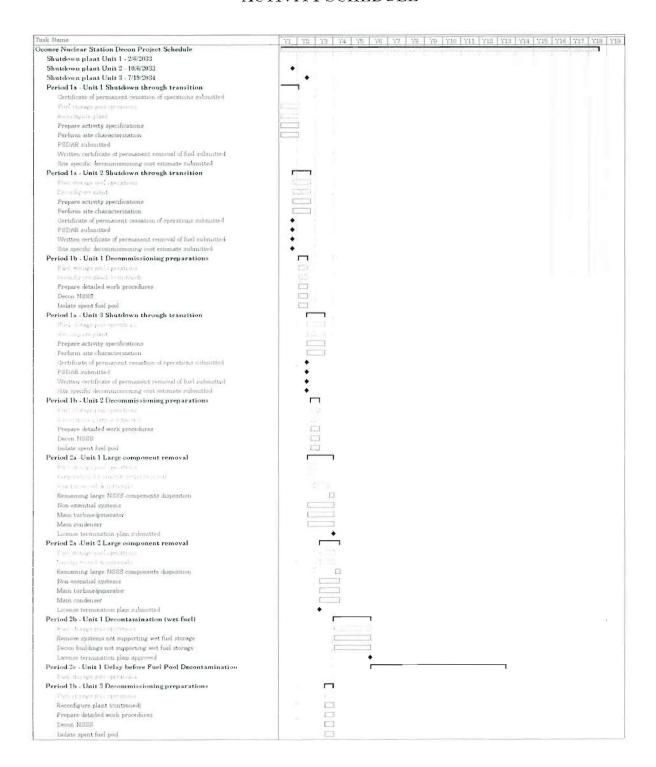
• For plant systems removal, the systems with the longest removal durations in areas on the critical path are considered to determine the duration of the activity.

#### 4.2 PROJECT SCHEDULE

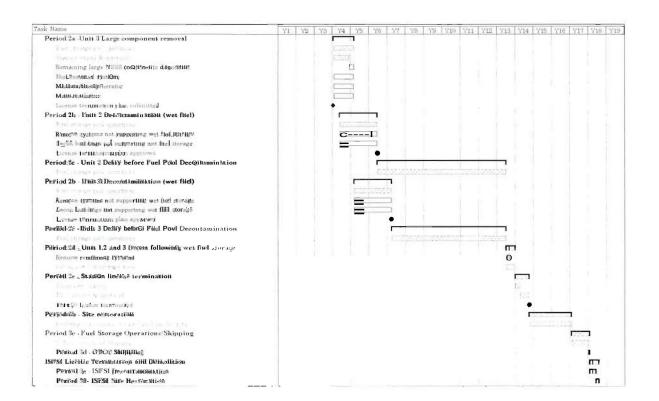
The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedules for decommissioning. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs. A second critical path is shown for the spent fuel storage period, which determines the release of the Fuel Building for final decontamination.

Project timelines are provided in Figures 4.2 and 4.3 with milestone dates based on the 2033 and 2034 shutdown dates. The fuel pools are emptied approximately twelve years after shutdown, while ISFSI operations continue until the DOE can complete the transfer of assemblies to its geologic repository. Deferred decommissioning in the SAFSTOR scenarios is assumed to commence so that the operating licenses are terminated within a 60-year period from the cessation of plant operations.

#### FIGURE 4.1 ACTIVITY SCHEDULE



### FIGURE 4.1 (continued) ACTIVITY SCHEDULE



#### Legend:

- Red text and/or shaded scheduling bars indicate clittical path activilities
- 2. Shaded scheduling bal's Associated with Major decombilissioning periods, e.g., Peliod 1a, Milicate over all duration of that period
- Blue text and/or diamond symbols likelicate major milestones

#### FIGURE 4.2 DECOMMISSIONING TIMELINE DECON

DECON	Shutdowr Decomms Prepara	ioning •		Fţōţnpl	C'eto'i,m'işsid DECON	oning		Site ⊑estorrihon	Decom	OSI- missioning Doerahuns	1000	ec-lin ant:	
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erode	1a	Ib	i)	24	26	∄4	2e	3b	3c	3d			IOr,
taft Dates	Oo-Feb-33	06-feh-34	12-Aug-34	19-Jan-;; <b>G</b>	06-Fob-38	30-Jun-45	031;1'an-46	10.Oc(-45	03·F.b-49	17-Jon-CD			31-Jan-5
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E,ap3Ell Time (Years)		iś	16	4:7	1; 7	13 3	130	15 3	153	163			
Unit 3													
i"IJod;	1a	16	2a	21	21	2d	2f	36	3(	3d	314	3i	Erl
Start Dates	119-Jul-3-1	lel-Jul-35	20-Jan-36	08-Mar-37	28-Mar-39	3.L.Jun-45	re-J.m-"""	lo.Oct-46	I);-'F2&.19	177.)***-50	31-Jan-50	03-Jun-50	03'Jg-:,
Dunllo"s (Years)	10	ūS	1.1	21	&!	Çē	08	23	10	01)4	0.3	02	
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FIGURE 4.3 DECOMMISSIONING TIMELINE SAFSTOR

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(⊲iiri C'ale	ibF.b-:iJ	06-Feb-34	tr:""/141',-i4	351 24.11q-3-1	::- oun-J5	1.1.7-50	OJ-Feb-Eli	Oo-Feb-8T	n,lkug-iJl	!]-Sp-B8	05-Jan-90	07-May-92	05-Feb-93	112-juli-9
Dijruihuis (Years) Elapsed TimEd (Year\$1)	11 0	OJ 13	<b>DJ</b> 15	10 9 12 4	4 6 17 J	ia(,0 53il	10 5a	J 5 5J 5	11 55 6	13 56.9	2.3 59.2	DB 600	2'3 C3	
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Goseg Time (Years)		13	15	11 7	II) J	53.5	54.5	55 D	559	52.0	saG	!/33	G1 7	
Unit 3														
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t311 ['.ale'"	191-Jul-34	1941u1-35	19-Oc1-35	19-Jan-36	July July	31 J#n-EJ	.OS FBD-t£	:Hell-8':1	25-A.JI)?9	,J)"JIJI 9C"		07-May-92	05-11:1-93	02-Jun-9
IJr,allQl)S [Years]	110	03	c <b>J</b> :	9.4	4.5	3t11	1 1	05	0,	16		DB	2 3	
Exop'Set Titile (It:4(Ir:1		13	1.5	n∕ Li	15.5	53 6	5J ti	55 1	560	578		586	60.9	
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#### 5. RADIOACTIVE WASTES

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC license. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act, [30] the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR Parts 173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in 10 CFR §173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The volumes of radioactive waste generated during the various decommissioning activities at the site are shown on a line-item basis in Appendices C and D, and summarized in Tables 5.1 through 5.6. The quantified waste volume summaries shown in these tables are consistent with Part 61 classifications. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone (i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides). While the dose rates decrease with time, radionuclides such as <sup>137</sup>Cs will still control the disposition requirements.

The waste material produced in the decontamination and dismantling of the nuclear plants is primarily generated during Period 2 of DECON and Period 4 of SAFSTOR. Material that is considered potentially contaminated when removed from the radiological controlled area is sent to processing facilities in Tennessee for conditioning and disposal. Heavily contaminated components and activated materials are routed for controlled disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling.

For purposes of constructing the estimates, the cost for disposal at the EnergySolutions' and Barnwell facilities were used as a proxy for future disposal facilities. Separate rates were used for containerized waste and large components, including the steam generators and reactor coolant pump motors. Demolition debris including miscellaneous steel, scaffolding, and concrete was disposed of at a bulk rate. The decommissioning waste stream also included resins and dry active waste.

Since EnergySolutions is not currently able to receive the more highly radioactive components generated in the decontamination and dismantling of the reactor, disposal costs for the Class B and C material were based upon the rate schedule for the Barnwell facility. Additional surcharges were included for activity, dose rate, and/or handling added as appropriate for the particular package.

#### TABLE 5.1 UNIT 1 DECON ALTERNATIVE DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface	EnergySolutions	A	88,941	4,730,858
disposal)	Barnwell	A	37,855	4,701,775
	Barnwell	В	3,887	490,800
	Barnwell	С	517	61,505
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	440	79,646
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	179,283	7,550,166
Total <sup>[2]</sup>			310,922	17,614,750

Waste is classified according to the requirements as delineated in Title  $10~\mathrm{CFR},\,\mathrm{Part}\,\,61.55$ 

Columns may not add due to rounding.

#### TABLE 5.2 UNIT 2 DECON ALTERNATIVE DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [til	Waste Volume (cubic feet)	Mass <b>(poulids)</b>
Low-Level Radioactive Waste (near-surface	EnergySolutions	A	98,675	5,417,984
disposal)	Barnwell	A	39,055	4,808,629
	Barnwell	<u>B</u>	8,887	490,800
	Barnwell	C	517	61,505
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GICC!	1 440	79,646
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	185;1284	7,803,156
Total <sup>[2]</sup>			328,IF57	18, <del>(; (</del> fi1,720

Waste is classified according to the requirements as delineated in Title 10 CFR, Part 6155

H Columns may not add due to rounding,

### TABLE 5.3 UNIT 3 DECON ALTERNATIVE DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface	EnergySolutions	A	130,961	8,826,751
disposal)	Barnwell	A	41,576	5,044,048
	Barnwell	В	3,887	490,800
	Barnwell	C	517	61,505
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	440	79,646
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	297,359	12,348,600
Total <sup>[2]</sup>			474,739	26,851,348

Waste is classified according to the requirements as delineated in Title 10 CFR. Part 61.55

Columns may not add due to rounding.

#### TABLE 5.4 UNIT 1 SAFSTOR ALTERNATIVE DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface	EnergySolutions	A	89,211	3,610,052
disposal)	Barnwell	A	37,693	4,673,685
	Barnwell	В	3,325	358,740
	Barnwell	C	517	61,505
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	440	79,646
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	200,736	8,470,709
Total [2]			331,921	17,2G4,33T

Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

Columns may not add due to rounding.

### TABLE 5.5 UNIT 2 SAFSTOR ALTERNATIVE DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface	EnergySolutions	A	96,878	4,153,283
disposal)	Barnwell	A	37,694	4,673,760
	Barnwell	В	3,325	358,740
	Barnwell	C	517	61,505
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	440	79,646
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	210,076	8,847,125
Total  2			348,929	18,174,059

Waste is classified according to the requirements as delineated in Title  $10~\mathrm{CFR},\,\mathrm{Part}\,\,61.55$ 

<sup>[2]</sup> Columns may not add due to rounding.

### TABLE 5.6 UNIT 3 SAFSTOR ALTERNATIVE DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface	EnergySolutions	A	122,944	7,112,560
disposal)	Barnwell	A	37,977	4,690,728
	Barnwell	В	3,325	358,740
	Barnwell	С	517	61,505
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	440	79,646
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	328,047	13,644,180
Total <sup>[2]</sup>			493,249	25,947,359

Waste is classified according to the requirements as delineated in Title  $10~\mathrm{CFR}.~\mathrm{Part}~61.55$ 

<sup>[2]</sup> Columns may not add due to rounding.

#### 6. RESULTS

The analysis to estimate the costs to decommission Oconee relied upon the site-specific, technical information developed for a previous analysis prepared in 2003. While not an engineering study, the estimates provide Duke Energy with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The estimates described in this report are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenarios assume continued operation of the station's spent fuel pools for a minimum of twelve years following the cessation of operations for continued cooling of the assemblies.

The cost projected to promptly decommission (DECON) Oconee is estimated to be \$1,571.6 million. The majority of this cost (approximately 79.2%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 14.7% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 6.1% is for the demolition of the designated structures and limited restoration of the site.

The cost projected for deferred decommissioning (SAFSTOR) is estimated to be \$1,777.5 million. The majority of this cost (approximately 81.9%) is associated with placing the plant in storage, ongoing caretaking of the plant during dormancy, and the eventual physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 11.0% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 7.1% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 thru 6.4, are either labor-related or associated with the management and disposition of the radioactive waste. Program management is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that Duke Energy will oversee the decommissioning program, acting as the DOC to manage the decommissioning labor force and the associated subcontractors. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating license is terminated, the staff is

substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pools will remain operational for a minimum of twelve years following the cessation of operations. The pools will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool area. Over the twelve-year period, the spent fuel will be packaged into transportable canisters for loading into a DOE-provided transport cask. Spent fuel will also be in storage at the ISFSI (from operations). This inventory will be transferred to the DOE as the pools are emptied.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including plant equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, disposition of the low-level radioactive material required controlled disposal is at the EnergySolutions' and Barnwell facilities. Highly activated components, requiring additional isolation from the environment (GTCC), are packaged for geologic disposal. The cost of geologic disposal is based upon a cost equivalent for spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary tables for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing union wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating license. Prompt demolition reduces future liabilities and can be more cost effective than deferral, due to the deterioration of the facilities (and therefore the working conditions) with time.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear plant.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining plant surface areas and surrounding environs, sampling, isotopic analysis, and documentation of the findings. The status of any plant components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs are greatly reduced following the final cessation of plant operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

### TABLE 6.1 UNIT 1 DECON ALTERNATIVE DECOMMISSIONING COST ELEMENTS

Cost Element	Total	Percentage
Decontamination	10,080	2.0
Removal	73,211	14.9
Packaging	12,144	2.5
Transportation	6,129	1.2
Waste Disposal	86,097	17.5
Off-site Waste Processing	19,449	3.9
Program Management [1]	191,212	38.8
Utility Site Indirect	17,743	3.6
Spent Fuel Pool Isolation	5,409	1.1
Spent Fuel Management  2	20,790	4.2
Insurance and Regulatory Fees	12,660	2.6
Energy	10,654	2.2
Characterization and Licensing Surveys	12,827	2.6
Property Taxes	7,550	1.5
Miscellaneous Equipment	6,503	1.3
Total [3]	492,457	100

Cost Element	Total	Percentage
License Termination	398,442	80.9
Spent Fuel Management	71,528	14.5
Site Restoration	22,487	4.6
Total [3]	492,457	100

III Includes engineering and security costs

Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer costs/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

### TABLE 6.2 UNIT 2 DECON ALTERNATIVE DECOMMISSIONING COST ELEMENTS

Cost Element	Total	Percentage
Decontamination	12,148	2.6
Removal	75,276	16.1
Packaging	12,428	2.7
Transportation	6,642	1.4
Waste Disposal	88,968	19.0
Off-site Waste Processing	20,101	4.3
Program Management [1]	166,894	35.7
Utility Site Indirect	15,826	3.4
Spent Fuel Pool Isolation	5,409	1.2
Spent Fuel Management [2]	19,117	4.1
Insurance and Regulatory Fees	10,605	2.3
Energy	10,104	2.2
Characterization and Licensing Surveys	10,550	2.3
Property Taxes	6,539	1.4
Miscellaneous Equipment	6,438	1.4
Total [3]	467,045	100

Cost Element	Total	Percentage
License Termination	377,426	80.8
Spent Fuel Management	67,591	14.5
Site Restoration	22,027	4.7
Total [3]	467,045	100

<sup>[1]</sup> Includes engineering and security costs

Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer costs/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

# TABLE 6.3 UNIT 3 DECON ALTERNATIVE DECOMMISSIONING COST ELEMENTS

Cost Element	Total	Percentage
Decontamination	17,119	2.8
Removal	118,973	19.4
Packaging	13,244	2.2
Transportation	8,194	1.3
Waste Disposal	95,945	15.7
Off-site Waste Processing	31,808	5.2
Program Management [1]	229,584	37.5
Utility Site Indirect	19,022	3.1
Spent Fuel Pool Isolation	7,212	1.2
Spent Fuel Management [2]	22,382	3.7
Insurance and Regulatory Fees	10,601	1.7
Energy	10,086	1.6
Characterization and Licensing Surveys	12,812	2.1
Property Taxes	6,862	1.1
Miscellaneous Equipment	6,441	1.1
Miscellaneous Site Services	1,811	0.3
Total [3]	612,096	100.0

Cost Element	Total	Percentage
License Termination	468,948	76.6
Spent Fuel Management	92,545	15.1
Site Restoration	50,603	8.3
Total [3]	612,096	100.0

III Includes engineering and security costs

Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer costs/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

#### TABLE 6.4 UNIT 1 SAFSTOR ALTERNATIVE DECOMMISSIONING COST ELEMENTS

Cost Element	Total	Percentage
Decontamination	9,338	1.6
Removal	72,536	12.2
Packaging	9,020	1.5
Transportation	5,106	0.9
Waste Disposal	69,540	11.7
Off-site Waste Processing	21,821	3.7
Program Management [1]	268,845	45.1
Utility Site Indirect	23,160	3.9
Spent Fuel Pool Isolation	5,409	0.9
Spent Fuel Management [2]	20,682	3.5
Insurance and Regulatory Fees	34,210	5.7
Energy	17,770	3.0
Characterization and Licensing Surveys	14,274	2.4
Property Taxes	7,880	1.3
Miscellaneous Equipment	16,083	2.7
Total [3]	595,675	100

Cost Element	Total	Percentage
License Termination	500,989	84.1
Spent Fuel Management	64,675	10.9
Site Restoration	30,011	5.0
Total [3]	595,675	100

<sup>[1]</sup> Includes engineering and security costs

 $<sup>^{[2]}</sup>$  Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer costs/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

### TABLE 6.5 UNIT 2 SAFSTOR ALTERNATIVE DECOMMISSIONING COST ELEMENTS

Cost Element	Total	Percentage
Decontamination	9,273	1.8
Removal	74,452	14.1
Packaging	9,187	1.7
Transportation	5,327	1.0
Waste Disposal	71,445	13.5
Off-site Waste Processing	22,790	4.3
Program Management [1]	208,870	39.6
Utility Site Indirect	17,810	3.4
Spent Fuel Pool Isolation	5,409	1.0
Spent Fuel Management  2	19,009	3.6
Insurance and Regulatory Fees	32,043	6.1
Energy	17,556	3.3
Characterization and Licensing Surveys	11,997	2.3
Property Taxes	6,870	1.3
Miscellaneous Equipment	16,035	3.0
Total [3]	528,074	100

Cost Element	Totall	Percentage
License Termination	435,993	82.6
Spent Fuel Management	62,588	11.9
Site Restoration	29,492	5.6
Total [1]	fi28,074	100

III Includes engineering and security costs

Excludes program management costs (staffing) but includes costs for spent fuel loading/tnams; fer costs/spent fuel pool O&MI and EP fees

M Columns may not add due to rounding

### TABLE 6.6 UNIT 3 SAFSTOR ALTERNATIVE DECOMMISSIONING COST ELEMENTS

Cost Element	Total	Percentage		
Decontamination	12,090	1.8		
Removal	117,255	17.9		
Packaging	9,742	1.5		
Transportation	6,260	1.0		
Waste Disposal	76,348	11.7		
Off-site Waste Processing	35,145	5.4		
Program Management [1]	255,960	39.2		
Utility Site Indirect	20,652	3.2		
Spent Fuel Pool Isolation	7,212	1.1		
Spent Fuel Management [2]	21,316	3.3		
Insurance and Regulatory Fees	32,146	4.9		
Energy	17,892	2.7		
Characterization and Licensing Surveys	14,259	2.2		
Property Taxes	7,182	1.1		
Miscellaneous Equipment	18,466	2.8		
Miscellaneous Site Services	1,811	0.3		
Total [3]	653,737	100.0		

Cost Element	Total	Percentage			
License Termination	518,504	79.3			
Spent Fuel Management	68,473	10.5			
Site Restoration	66,760	10.2			
Total [3]	653,737	100.0			

III Includes engineering and security costs

Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer costs/spent fuel pool O&M and EP fees

BI Columns may not add due to rounding

#### 7. REFERENCES

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- 2. U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72, "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988
- 3. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," October 2003
- 4. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, "Radiological Criteria for License Termination"
- 5. U.S. Code of Federal Regulations, Title 10, Parts 20 and 50, "Entombment Options for Power Reactors," Advanced Notice of Proposed Rulemaking, Federal Register Volume 66, Number 200, October 16, 2001
- 6. U.S. Code of Federal Regulations, Title 10, Parts 2, 50 and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, Federal Register Volume 61 (p 39278 et seq.), July 29, 1996.
- 7. "Nuclear Waste Policy Act of 1982 and Amendments," U.S. Department of Energy's Office of Civilian Radioactive Management, 1982
- 8. "DOE Announces Yucca Mountain License Application Schedule", U.S. Department of Energy's Office of Public Affairs, Press Release July 19, 2006
- 9. U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses"
- 10. "Low Level Radioactive Waste Policy Act," Public Law 96-573, 1980
- 11. "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, 1986
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#### 7. REFERENCES

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- 13. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, "Radiological Criteria for License Termination," Federal Register, Volume 62, Number 139 (p 39058 et seq.), July 21, 1997
- 14. "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination," EPA Memorandum OSWER No. 9200.4-18, August 22, 1997.
- 15. U.S. Code of Federal Regulations, Title 40, Part 141.16, "Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in community water systems"
- 16. "Memorandum of Understanding Between the Environmental Protection Agency and the Nuclear Regulatory Commission: Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites," OSWER 9295.8-06a, October 9, 2002
- 17. "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," NUREG/CR-1575, Rev. 1, EPA 402-R-97-016, Rev. 1, August 2000
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- 20. "Building Construction Cost Data 2008," Robert Snow Means Company, Inc., Kingston, Massachusetts
- 21. Project and Cost Engineers' Handbook, Second Edition, p. 239, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, 1984
- 22. Civilian Radioactive Waste Management System Waste Acceptance System Requirements Document, Revision 5" (DOE/RW-0351) issued May 31, 2007
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- 24. Tri-State Motor Transit Company, published tariffs, Interstate Commerce Commission (ICC), Docket No. MC-427719 Rules Tariff, March 2004, Radioactive Materials Tariff, February 2006
- 25. J.C. Evans et al., "Long-Lived Activation Products in Reactor Materials" NUREG/CR-3474, Pacific Northwest Laboratory for the Nuclear Regulatory Commission. August 1984
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# $\label{eq:appendix} \textbf{APPENDIX}\, \textbf{A}$ UNIT COST FACTOR DEVELOPMENT

### $\frac{\text{APPENDIX A}}{\text{UNIT COST FACTOR DEVELOPMENT}}$

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

#### 1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

#### 2. CALCULATIONS

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
a b c d e f g h	Remove insulation Mount pipe cutters Install contamination controls Disconnect inlet and outlet lines Cap openings Rig for removal Unbolt from mounts Remove contamination controls Remove, wrap, send to waste processing area	60 60 20 60 20 30 30 15 60	(b) 60 (b) 60 (d) 30 30 15
+ Re + Ra	Totals (Activity/Critical)  ation adjustment(s): spiratory protection adjustment (50% of critical duration/ALARA adjustment (37% of critical duration sted work duration		255 128 <u>95</u> 478
Prod	otective clothing adjustment (30% of adjusted durati		143 621
	ork break adjustment (8.33 % of productive duration work duration (minutes)	)	<u>52</u> 673

#### \*\*\* Total duration = 11.217 hr \*\*\*

<sup>\*</sup> alpha designators indicate activities that can be performed in parallel

#### APPENDIX A

(continued)

### 3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate (\$/hr)	Cost
Laborers	3.00	11.217	\$**.**	\$***.**
Craftsmen	2.00	11.217	\$** **	\$****
Foreman	1.00	11.217		\$***.**
General Foreman	0.25	11.217	\$**.**	\$***.**
	0.05	11.217	\$**.**	\$**.**
Health Physics Technician	1.00	11.217	\$**.**	<u>\$***.**</u>
Total Labor Cost				\$3,097.30
4. EQUIPMENT & CON	SUMABLES	COSTS		
Equipment Costs				none
				\$27.50
2	\$8.50 \$9.94			
Craftsmen 2.00 11.217 \$**.** \$ Foreman 1.00 11.217 \$**.** \$ General Foreman 0.25 11.217 \$**.** \$ Fire Watch 0.05 11.217 \$**.** \$ Health Physics Technician 1.00 11.217 \$**.** \$  Total Labor Cost \$3  4. EQUIPMENT & CONSUMABLES COSTS  Equipment Costs  Consumables/Materials Costs -Blotting paper 50 @ \$0.55 sq ft 111 -Plastic sheets/bags 50 @ \$0.17/sq ft 121 -Gas torch consumables 1 @ \$9.94/hr x 1 hr 131  Subtotal cost of equipment and materials Overhead & profit on equipment and materials Overhead & profit on equipment and materials TOTAL COST:  Removal of contaminated heat exchanger <3000 pounds: \$3, Total labor cost: \$3, Total equipment/material costs:		\$45.94		
	\$7.35			
Total costs, equipment & mat	erial			\$53.29
TOTAL COST:				
Removal of contaminated	d heat exchai	nger <3000 pc	ounds:	\$3,150.59
Total labor cost:				\$3,097.30
Total equipment/material cos	ts:			\$53.29
Total craft labor man-hours re	equired per un	iit:		81.88

<sup>\*\*</sup> denotes business sensitive information

#### 5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.
- References for equipment & consumables costs:
  - 1. McMaster-Carr, Item 7193T88, Spill Control
  - 2. R.S. Means (2008) Division 01 56, Section 13.60-0200, page 20
  - 3. R.S. Means (2008) Division 01 54 33, Section 40-6360, Reference-10
- Material and consumable costs were adjusted using the regional indices for Greenville, South Carolina.

Unit Cost Factor	Cost/Unit(\$)
	0.01
Removal of clean instrument and sampling tubing, \$/linear foot	0.31 3.16
Removal of clean pipe 0.25 to 2 inches diameter, \$/linear foot Removal of clean pipe >2 to 4 inches diameter, \$/linear foot	4.70
Removal of clean pipe >2 to 4 inches diameter, \$/linear foot	9.81
Removal of clean pipe >8 to 14 inches diameter, \$/linear foot	18.36
Removal of clean pipe >14 to 20 inches diameter, \$/linear foot	23.88
Removal of clean pipe >20 to 36 inches diameter, \$/linear foot	35.14
Removal of clean pipe >36 inches diameter, \$/linear foot	41.74
Removal of clean valve >2 to 4 inches	63.91
Removal of clean valve >4 to 8 inches	98.11
Removal of clean valve >8 to 14 inches	183.62
Removal of clean valve >14 to 20 inches	238.81
Removal of clean valve >20 to 36 inches	351.35
Removal of clean valve >36 inches	417.41
Removal of clean pipe hanger for small bore piping	20.87
Removal of clean pipe hanger for large bore piping	71.48
Removal of clean pump, <300 pound	165.57
Removal of clean pump, 300-1000 pound	475.00
Removal of clean pump, 1000-10,000 pound	1,851.75
Removal of clean pump, -10,000 pound	3,581.40
Removal of clean pump motor, 300-1000 pound	199.24
Removal of clean pump motor, 1000-10,000 pound	770.54
Removal of clean pump motor, >10,000 pound	1,733.71
Removal of clean heat exchanger <3000 pound	996.02
Removal of clean heat exchanger >3000 pound	2,507.43
Removal of clean feedwater heater/deaerator	7,056.68
Removal of clean moisture separator/reheater	14,492.15
Removal of clean tank, <300 gallons	213.00
Removal of clean tank, 300-3000 gallon	671.39
Removal of clean tank, >3000 gallons, \$/square foot surface area	5.83

Unit Cost Factor	Cost/Unit(\$)
	00.00
Removal of clean electrical equipment, <300 pound	90.08 324.39
Removal of clean electrical equipment, 300-1000 pound Removal of clean electrical equipment, 1000-10,000 pound	648.77
Removal of clean electrical equipment, >10,000 pound	1,564.83
Removal of clean electrical transformer < 30 tons	1,086.75
	3 100 07
Removal of clean electrical transformer > 30 tons	3,129.67
Removal of clean standby diesel generator, <100 kW	1,110.04
Removal of clean standby diesel generator, 100 kW to 1 MW	2,477.65
Removal of clean standby diesel generator, >1 MW	5,129.25
Removal of clean electrical cable tray, \$/linear foot	8.44
Removal of clean electrical conduit, \$/linear foot	3.69
Removal of clean mechanical equipment, <300 pound	90.08
Removal of clean mechanical equipment, 300-1000 pound	324.39
Removal of clean mechanical equipment, 1000-10,000 pound	648.77
Removal of clean mechanical equipment, >10,000 pound	1,564.83
Removal of clean HVAC equipment, <300 pound	90.08
Removal of clean HVAC equipment, 300-1000 pound	324.39
Removal of clean HVAC equipment, 1000-10,000 pound	648.77
Removal of clean HVAC equipment, >10,000 pound	1,564.83
Removal of clean HVAC ductwork, \$/pound	0.33
Removal of contaminated instrument and sampling tubing, \$/linear foot	1.11
Removal of contaminated pipe 0.25 to 2 inches diameter, \$/linear foot	15.17
Removal of contaminated pipe >2 to 4 inches diameter, \$/linear foot	25.84
Removal of contaminated pipe >4 to 8 inches diameter, \$/linear foot	43.13
Removal of contaminated pipe > 8 to 14 inches diameter, \$/linear foot	82.20
D	00.40
Removal of contaminated pipe >14 to 20 inches diameter, \$/linear foot	98.49
Removal of contaminated pipe >20 to 36 inches diameter, \$/linear foot	135.79
Removal of contaminated pipe >36 inches diameter, \$/linear foot	160.25
Removal of contaminated valve >2 to 4 inches	326.62
Removal of contaminated valve >4 to 8 inches	393.86

Unit Cost Factor	Cost/Unit(\$)
Removal of contaminated valve >8 to 14 inches	780.29
Removal of contaminated valve >14 to 20 inches	989.97
Removal of contaminated valve >20 to 36 inches	1,316.18
Removal of contaminated valve >36 inches	1,560.76
Removal of contaminated pipe hanger for small bore piping	78.62
Removal of contaminated pipe hanger for large bore piping	244.64
Removal of contaminated pump, <300 pound	702.89
Removal of contaminated pump, 300-1000 pound	1,641.37
Removal of contaminated pump, 1000-10,000 pound	5,143.20
Removal of contaminated pump, >10,000 pound	12,524.89
Removal of contaminated pump motor, 300-1000 pound	705.79
Removal of contaminated pump motor, 1000-10,000 pound	2,103.41
Removal of contaminated pump motor, >10,000 pound	4,722.48
Removal of contaminated heat exchanger <3000 pound	3,150.59
Removal of contaminated heat exchanger >3000 pound	9,151.21
Removal of contaminated tank, >300 gallons, \$/square foot	22.91
Removal of contaminated electrical equipment, <300 pound	540.27
Removal of contaminated electrical equipment, 300-1000 pound	1,322.90
Removal of contaminated electrical equipment, 1000-10,000 pound	2,547.19
Removal of contaminated electrical equipment, >10,000 pound	5,006.30
Removal of contaminated electrical cable tray, \$/linear foot	26.06
Removal of contaminated electrical conduit, \$/linear foot	12.21
Removal of contaminated mechanical equipment, <300 pound	601.38
Removal of contaminated mechanical equipment, 300-1000 pound	1,462.15
Removal of contaminated mechanical equipment, 1000-10,000 pound	2,810.75
Removal of contaminated mechanical equipment, >10,000 pound	5,006.30
Removal of contaminated HVAC equipment, <300 pound	601.38
Removal of contaminated HVAC equipment, 300-1000 pound	1,462.15
Removal of contaminated HVAC equipment, 1000-10,000 pound	2,810.75

Unit Cost Factor Co	st/Unit(\$)
Removal of contaminated HVAC equipment, >10,000 pound Removal of contaminated HVAC ductwork, \$/pound	5,006.30 1.66
Removal/plasma arc cut of contaminated thin metal components, \$/linear in. Additional decontamination of surface by washing, \$/square foot	2.84 5.69
Additional decontamination of surfaces by hydrolasing, \$/square foot	28.17
Decontamination rig hook up and flush, \$/ 250 foot length	5,093.89
Chemical flush of components/systems, \$/gallon	15.66
Removal of clean standard reinforced concrete, \$/cubic yard	110.23
Removal of grade slab concrete, \$/cubic yard	140.47
Removal of clean concrete floors, \$/cubic yard	294.41
Removal of sections of clean concrete floors, \$/cubic yard	852.12
Removal of clean heavily rein concrete w/#9 rebar, \$/cubic yard	202.12
Removal of contaminated heavily rein concrete w/#9 rebar, \$/cubic yard	1,689.94
Removal of clean heavily rein concrete w#18 rebar, \$/cubic yard	255.63
Removal of contaminated heavily rein concrete w/#18 rebar, \$/cubic yard	2,235.92
Removal heavily rein concrete w#18 rebar & steel embedments, %cubic yard	376.88
Removal of below-grade suspended floors, \$/cubic yard	294.41
Removal of clean monolithic concrete structures, \$/cubic yard	711.34
Removal of contaminated monolithic concrete structures, \$/cubic yard	1,685.68
Removal of clean foundation concrete, \$/cubic yard	560.16
Removal of contaminated foundation concrete, \$/cubic yard	1,570.81
Explosive demolition of bulk concrete, \$/cubic yard	25.51
Removal of clean hollow masonry block wall, \$/cubic yard	72.17
Removal of contaminated hollow masonry block wall, \$/cubic yard	261.02
Removal of clean solid masonry block wall, \$/cubic yard	72.17
Removal of contaminated solid masonry block wall, \$/cubic yard	261.02
Backfill of below-grade voids, \$/cubic yard	16.27
Removal of subterranean tunnels/voids, \$/linear foot	86.48
Placement of concrete for below-grade voids, \$/cubic yard	138.80
Excavation of clean material, \$/cubic yard	2.66

Unit Cost Factor	Cost/Unit(\$)
Excavation of contaminated material, \$/cubic yard	36.01
Removal of clean concrete rubble, \$/cubic yard	21.07
Removal of contaminated concrete rubble, \$/cubic yard	22.16
Removal of building by volume, \$/cubic foot	0.26
Removal of clean building metal siding, \$/square foot	0.76
Removal of contaminated building metal siding, \$/square foot	3.04
Removal of standard asphalt roofing, \$/square foot	1.45
Removal of transite panels, \$/square foot	1.68
Scarifying contaminated concrete surfaces (drill & spall), \$/square foot	11.93
Scabbling contaminated concrete floors, \$/square foot	6.34
Scabbling contaminated concrete walls, \$/square foot	15.97
Scabbling contaminated ceilings, \$/square foot	54.04
Scabbling structural steel, \$/square foot	5.50
Removal of clean overhead crane/monorail < 10 ton capacity	472.58
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,418.62
Removal of clean overhead crane/monorail >10-50 ton capacity	1,134.20
Removal of contaminated overhead crane/monorail >10-50 ton capacity	3,404.07
Removal of polar crane > 50 ton capacity	4,785.69
Removal of gantry crane > 50 ton capacity	19,560.45
Removal of structural steel, \$/pound	0.17
Removal of clean steel floor grating, \$/square foot	3.59
Removal of contaminated steel floor grating, \$/square foot	10.80
Removal of clean free standing steel liner, \$/square foot	8.74
Removal of contaminated free standing steel liner, \$/square foot	26.73
Removal of clean concrete-anchored steel liner, \$/square foot	4.37
Removal of contaminated concrete-anchored steel liner, \$/square foot	31.16
Placement of scaffolding in clean areas, \$/square foot	14.81
Placement of scaffolding in contaminated areas, \$/square foot	22.55
Landscaping with topsoil, \$/acre	23,625.46
Cost of CPC B-88 LSA box & preparation for use	1,749.60

Unit Cost Factor	Cost/Unit(\$)
Cost of CPC B-25 LSA box & preparation for use	1,535.73
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,502.82
Cost of CPC B-144 LSA box & preparation for use	9,437.03
Cost of LSA drum & preparation for use	125.77
Cost of cask liner for CNSI 8 120A cask (resins)	7,082.55
Decontamination of surfaces with vacuuming, \$/square foot	0.49

#### APPENDIX C

#### DETAILED COST ANALYSIS

#### **DECON**

Tabl	le	Page
C-1	Oconee Nuclear Station, Unit 1	2
C-2	Oconee Nuclear Station, Unit 2	11
C-3	Oconee Nuclear Station, Unit 3	20

Table C-1
Oconce Nuclear Station - Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

	-					Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial \	/olumes		Burial /		Utility and
Activity		Decan		Packaging					Total		Lic. Term.	Management	Restoration	Volume	Class A		Class C	STCC		Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
PERIOD 1	a - Shutdown through Transition																				
	Direct Decommissioning Activities								4												
18.1.1	Prepare preliminary decommissioning cost		*		12	8		85	13	101	101	-	-			•				-	1.300
10.12	Notification of Cessation of Operations Remove fuel & source material									n/a											
ta t d	Notification of Permanent Defueling									14/4											
\a 1 C	Deactivate plant systems & process waste									4											
:(1-	Prepare and submit PSDAR							135	20	156	156										2.000
10.T.T.	Review plant dwgs & specs	-	-	-		(*)		311	47	358	358				6.00	160	100				4.600
18.1.8	Perform detailed rad survey									. 8											
1a.1 B	Estimate by-product inventory	100	-	199	(=)	(*)		6.8	10	78	76	-	1.0		1.0				(10)		1,000
	End product description					1-1	-	58	10	78	78		(*)	-		*	-		1.0	-	1.000
18 1 11	Detailed by-product inventory					1.0		88	13	101	101	-	1.0	-		-	1.0			-	1 300
	Define major work sequence				-			507	76	563	583	-								-	7.500
	Perform SER and EA Perform Site-Specific Cost Study		-		-	-		210	35 51	389	241	-		-	-					-	3,100
	Prepare/submit License Termination Plan				1-1	-	-	277	42	319	319	-	1.0		-		-			-	5 000 4 095
	Receive NRC approval of termination plan				•			2,1.1	42	a	370	-	-		-			-	•	•	4 000
Activity St	seofications																				
14 1 17 1	Plant & temporary facilities			-				333	50	383	344		38								4,930
	Plant systems				-	-		282	42	324	292		32			-				-	4 167
	NSSS Decontamination Flush			-		-	-	34	5	39	39					-			15	170	500.
	Reactor internats				-			480	72	552	552	-		1.5			-		-	1.0	7 100
	Reactor vessel							440	66	506	506			-			120	2.0	-		6.500
	Biological shield	3,40			1.00	(*)	-	34	. 5	39	39	-		-			100			1.00	500
	Steam generators				100			211	32	243	243	,	-	-			1.00			-	3 130
	Reinforced concrete Main Turbine				/80			108	16	124	52		62		-		(**)				1 600
	Main Condensers		-	-				27	4	31		-	37	-		-			-	-1	400
	1 Plant structures & buildings					-		211	32	243	121		121								3.120
	2 Waste management							311	47	358	358		. 147								4 500
	3 Facility & site close out			-			-	61	19	70	35		35		_		-				900
18.1.17		100		-	14.0	1-1	-	2,555	384	2.942	2.591		381	-	-			1.0	-	1.0	37.527
P100mrU1'Q	& Site Preparations																				
	Prepare dismanting sequence				-	147		162	24	187	187						14		1.0		2 400
	Plant prep. & temp. svces				-			2.700	405	3 105	3.105		-		-				-		
	Design water clean-up system	-	*	-	~			95	14	109	109	-				-	-			-	1 400
	Rigging/Cont. Cntrl Envips/tooling/etc	-	•	-	-		•	2.100	315	2.415	2.415			*			-				
10.1	Produce casks/liners & containers Subtotal Period 1a Activity Costs			:				8.788 8.788	1.466	11.256	10.905		351	-						-	1.230 73.753
Period 1a	Additional Costs																				
ts 2.1	Asbestos Remediation		2 759	7	283		2.164		1.273	6,481	6.481				25 455	-		-	330 915	35 451	
18.2	Subtotal Period 1a Additional Costs.		2 759				2.164	181	1 273	5,481	6.481			-	25 455	-		-	330,015	35 451	
	Collateral Costs																				
7431	Small tool allowance		42		-	100			G.	48	48	50		-				-		-	-
ta.3.2	Spent Fidel Capital and Transfer	-					. * .	1.250	187	1.437	*	1-4j?					1.00	-			
ta3	Subtotal Period 1a Collateral Costs		42		(*)	3.5	5.00	1 250	194	1, J.	48	!JAj-i	1.0	-	-		1-	-	-		
Penad ta	Petrod-Depatided Costs							379	78	e'"	857										
43	litta'tin'ce				-				139	ı HI	150)		-		-					-	-
14.40	P,GPe:", I.i.,							5:193	1.19	1 111	50)									-	

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Table (-1)

O(COL)(C Nuclear Station - Unit 1

DECON Decommissioning Cost Estinlate (thousands of WOOS doll##16)

Off-SitQ Spent Fuel LIRIN Utility :and NRC Sith Processend **Burial Volumes** Bunall Piocnaing; Olspoteal Other CIONA Class a ChanC Gree Activity b.Con Removal Pacékagifili TtJmSport Tatal Total Lit. Term. Restoration Volume Proc&ssod Clbft Contt X for Monagement Costs ContinQuncy Cu. Feet Cu. Feet Cu. Fill Cu. Feet Index Activity Description Cost Cost Costs Costs Cosis Costs Costs Costs Costs Cu. Feet Wt., Ltds, Mannours Manhours Period 1a Period-Dependent Cests (continued) 154 770 770 10.60.0 Mettin physics supplies ⊞rarv f 8'quoClmtll1t rental Jack 1 6 529 529 Disposal of OAW Qfinifflitted 10 26 54 519 1,23718 24 1.101 Plieft Ne-rgy budget 15031 15-31 12.47 -10 '111 Thu Eme1i)ency Flanning Filins 1a.dl8 127 11 311 311 15,56 "c \$P<fnt f=u.I"ooI 06\W SIL 112 8G2 10 4 10 0<., 2 517 310703 1114111 392 Indirect Overhead 196 Jii 3),. Se-:uflty SiaM Co-s.1 54,007 3:Q.Q1 Oll . 50• Jill \&i 15 4 Subfi3tal Penod 103 Penod-Dependent & CISU • atE: 10 29 JJ '66 J9 J59 n""J JD 12 J76 23 15.3 140 ICIAL PERIOD 10 COST 3 577 1C 80 224 7 5137 58 591 55 620 2 6 1 0 351 2550U 543 293 35 474 ':1:-iS9: 10.0 252 € 180 PERIOD 1b - Decommis.aioning Preparations 5#1,0.dlto\_,"reac(teCOIII"m"l!lo(t1""9,A01.II'.# Qetable Ways Procedures 1st fl11 Plant systems 320 £3 358 37 4.793 10=coff tt.112 NSSS Desortamination films '0 :5 73 11 It; 11 RtJs:01 Inteffith

1: 14 Minimal Wild Library

15.11CL CRD Q30ing assemble 1: & CRCnG0J5Ingst f.ll:1fi 1691 ... 2500 **">J** 94 12:5 79 13SQ CRD Q30ing assembly 5° 10. '0 1J '000 CRCnG0J5Ing t til::lfiJce-; Il'Utcre InSfi1.1", # Il'Utcre InSfI1.I",,@al.c;fv 100, 2111 282 :2 47 Figure (City) (Ot\*O'J1 ,3 Hi 15.11 HI Walln \nlem Ci. 1jt 1 1 11 Biological 15held 1200 12 91 93 15 1 1 19 14 nu.", gt "f" fill Ofos. Ir ):4 358 13 L 1 IJ Res/IIIrLNtcnCttolots 6. () E h , teo IF.1 t'4 Main T,Jff;ong 1 17.15 Ham Condt/14ehrs 121 1.560 ta: 1136 16 18 11.550 1et 1s:1 f '6 A'withary building HIS le.s. 2.730 101311 17 Reactor building 1011 1 Total 212 19: 3,-324 e 2 SFI5 9 000 P22-11 4.86 258 773 1) 12 Itl: Ct COMar, Ito:lp 515 773 1 C57 14 1 Sittingotatal POllock 16 Australity C'XIUI 515 2.248 595 315C! 2B72 -185 1 CS7 HJ 2.43 Period 1b Additional Costs " m-≥ 927 -Cl:,• 10:2 1 Spent Full Excal legistion 1715.05. 5 4/19 5 409 IS# 9 100 9 100 7 852 7 853 He 2. Site Characterization Survey I HOS 31-05 5iw." Per fX1lb N16:iloflOic" 4 If 114 9.214 Period 'ti Collinional Costs 1b.31 1915 De1:CJtTt!'qLIPfTle(("I! in 12 Proceu Iquid walte 29 56 1771 23/73 E:=9 ₃ llSe -53 lis 824 185 to p J 1934 Home Caffill'q eql/lpfTlt!r! : ,300 1:0 1.450 1 150 1(1:3 5 1610 ullo:QM flg OJ J10 1610 6per:1 Fuel CSOllat and Transfer 1b.3.6 202 202 25 :,6 95.834 ;a 10 1 5.4Dto3tf PiOHXI 'bLtAlate1d Cotts 2312 55 2173 7 8.1€ 188 762 1.001 7"248

TLG Services, fnr.

Table C-1
Oconce Nuclear Station - Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burtal V	olumes.		Burial/		Utility an
Activity		Decon	Removal	Packaging	Transport			Other	Total	Total	Lic, Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contracto
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feel	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhour
eriod to	Ferrod-Dependent Costs																				
	Decon supplies	27			121	-				34	34	-	140	1.4	7.00	100		100		12.	
1b.4.2	Insurance						-	393	39	432	432		-				140	-		-	
10.43	Property taxes				-			702	70	773	773	-			(4)						-
	Health physics supplies	-	259		-				65	324	324		2	12			190	-			-
	Heavy equipment rental		232						35	267	267			18				12		100	-
10.46	Disposal of DAW generated			6	€.		15		-5	31	31		-		359		-		7.173	13	
	Plant energy budget		-					1.342	201	1,543	1 543			-	-	-	-	-	4		- 3
	NRC Feet					1041		358	36	393	393	2	-	- 6	-				- 2	-	
10.4.9	Emergency Planning Faes							142	14	157								-	2		
	FEMA Fees							64	10	73	73		-		-			-		-	
	Spent Fuel Pool G&M							378		435		435	-	_				-	_	-	-
	Indirect Overhead							1.645	247	1.892	1.892			-			-	-		-	
	Security Staff Cost						-	603		693	693				-		-				23.63
	Unlity Staff Cost							15 430		17.744	17 744				-			-			
10.4	Subtotal Period 1b Period-Dependent Costs	27	491	6	c		15	21.056			24 200	591			359				7.173	13	298.5
140178	Subtotal Fellow III Fellow-Septiment strate		40.1				1000	4 900	0.100	125,191	2-200										
10.0	TOTAL PERIOD 15 COST	2 855	1.492	62	176	~	2.388	31,111	6.527	44.612	43.333	793	486	-	547	762	-		102 998	20 365	339.6
PERIOD 1	1 TOTALS	2.855	5.369	74	458	*	4.579	75.335	14.514	103.193	98.952	3 403	836	*	26.621	762	-	-	446 291	55 838	896.50
PERIOD 2	2a - Large Component Removal																				
Period 2a	Direct Decommissioning Activities																				
thirday G	Iteam Supply System Removal																				
	Reactor Coolant Piping	156	150	16	35		254		186	798	796		12		965				116 739	7 013	12
	Pressurget Relief Tank	14		3	7		45		23	104	104				166				20.849	612	
	Reactor Coolant Pumpe & Motors	96	59	40	277		1,929		614	3 163	3.163			374	7.504				796 624	4.216	
	Pressurer	33	45	324		-	1 177		355	1 935	1.935			-	1.547	0			107 504	2 361	
	Steam Generators	140	1.537	1 164	791		11.258		3.581	18.781	18.781				12 866		- 0		1.810.770	11.616	
				585	760		11.288		3.004	16 737	15 737				12 866				1,810,770	5 400	
	CRDMs/ICIs/Service Structure Removal	132	73	237	84		169		163	859	859				3.518				77.700	4 476	
	Reactor Vessel Internate	89	2 160	4 528	510		8 554	210		23 285	23 285				526	1 122	517		287 160	26 133	
	Reactor Vessel	6.3		1 368	246		9 696	210		24 306	24 306				5.862	2.003		0	956 040	26.133	
		725	9 560	# 365	2 708			420		88 967	88 967			374	47 241	2 125	517	0	5.984.257	87 961	
2# 1.1	Totals	7.25	9 560	2.700	2 100	132	the sall 1	4413	23 045	50.301	99 367			3/4	41 241	2 740	317	-	2 204 731	01 201	~ 2
	of Major Equipment					***			202	2.005	2.000			2 040	2.477				747.400	75 16 75 4	
	Main Turbine/Generator		308	299	78				327	2.088	2.088	-		3 819	2.127				515 460	7 674	
2a.1.3	Main Condensers	*	919	113	54	508	291	-	798	2.283	2,283			5 044	1 487	-		-	360.419	23 585	
	g Costs from Clean Building Demolition																				
	Reactor Bialding		7.10				-	-	106	816	816		-	-	-	-	-	-	-	9 379	
28.14.2	Auxiliary Building	9	90				*	-	14	105	105		-		-	-	-		-	1 333	
28.1.4.3	Turbine Building		182						27	200	209		~	-		-	-	3	-	3 027	
28.14.4	Fuel Building		70		-	•	*	-	10	80	80				8		-	2		961	
24.14	Totals		1.953		8	*		-	158	1.211	1,211				•		*	*		14 700	
	of Plant Systems																				
24151	Chemical Addition		-27			-		1.5	4	31	-		31		-	-				821	
2a.1.8.2	Chemical Addition RCA		27	C	1	70	-		9	<j< td=""><td>52</td><td></td><td></td><td>222</td><td></td><td></td><td>9</td><td>-</td><td>'Ji:lt</td><td>\$0,</td><td></td></j<>	52			222			9	-	'Ji:lt	\$0,	
2a 15 3	Condensate		579				-	-	11	,lllo	-		150>				-	9	-	15.699	
28.15.4	Condensate (Contaminated)		601	35	- 1				568	4 055	4 865	100		30 363		9			12)) 881	15 479	
			338	-	-			*	51	389			.,ego	-				-		10 040	
	Electric Hydraulic Turbine Control		18				-		2	29			20				-			499	
	Feedwater & Emergency Feedwater		163						d.A	167			hiT		-			_		4 882	
24.157										-7.								-	IV".g:,e	17,000	

TLG Sertleses, litte.

Table C-1
Oconee Nuclear Station - Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

To the second		20.10	Salar Francisco	had to the		Off-Site	LLRW		- ALMOND 111		NRC	Spent Fuel	Site	Processed			/olumes		Burial (		Utility an
Activity		Decon	Removal		Transport		Disposal	Other	Total		Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C	GTCC Cu. Feet	Processed Wt., Lbs.	Graft Manhours	Contract
index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	COSIS	Costs	Cu. Feet	Cu. reet	Cu, Feet	Cu. reet	Cu. Feet	W. LDS.	mannours	Mannou
	of Plant Systems (continued)																				
28 1,5.9	Feedwater & Emergency Feedwater RCA	(%)	237	6	11	438	(*)	(*)	127	820	820			4 815			•	-	195 560	5,531	
2a 15 10	Heater Drains	-	368	-	-		-	180	55	423		100	423	ner Prince o		-	=	-		11.003	
	Heater Drains (Contaminated)	160	293	-	13	493		(-)	150	956	956	-	-	5 419	-				220 074	7 497	
	Heater Vent	147	37	-				12		36			36	-	-	-	*	-		1 002	
	High Pressure Extraction	100	24	-	190	0.00	0.00	1967	.4	27		(+)	27			-		*	-	729	
	Hydraulic Oil	~	. 2	-		~	(w)		-0	3	**	-	3	-	-	-	-	-		75	
	Hydrogen		28.	-	-	-	(4)		4	32		197	32	•		-	-	*	-	848	
	Hydrogen Seal Oil		30	-		100	547	-	4	34		120	34			-				923	
	Low Pressure Extraction	4	36	-	~	100	121	-	6	41	-		41	1.0	-	-	-	-		1.096	
	Main Steam	-	34	-	•	-	-	100	13	97	3/10	100	97	45.00	-	2	-	-	a verifica	2,550	
	Main Steam RCA	-	304	37	85	2:530	-	-	469	3,406	3.406	-	2.0	27.806		-	-	-	1 129,284	7.693	
	Moreture Separator Reneater Drains	•		2	0	- 6	-	-	3	15	15		•	65	0	-	-	-	2 629	166	
	Post Accident Monitoring	550	29		1	37	(6)		13	80	80		•	401		-	-	2	16 304	785	
	Reactor Building Spray	107	5.5	3	5	191	(6)	-	52	330	339			2,105	1000				85 486	2 150	
	Sample Monitoring		114	8	13	22	85	3.75	56	298	298	-	•	244	436			-	49 030	3,105	
28 1 5 34	Stator Cociant		49		1.51	(*)	150	1.0	7	56	17.0		58	•		-	=	=	-	1 507	
28.1.5.25	Steam Drain		81		2 = 2	1.5			12	93	1		93	-		8				2,668	
28 1 5 25	Steam Seal		리문		- 1	48	-		19	118	118			533			-	7	21.649	1 150	
2a 15 27	Tutbine Oil	1001	121		-			200	18	139	-	(*)	139	4		-		-	-	3.518	
2a 1.6.28	Vacuum	-	114	-		-		-	17	131	5-7		137			-	=	-	-	3 438	
2a 15	Totals	1-1	3 957	109	192	5 933	35	(*)	1 895	13.231	10 882	-	2 349	76 870	436	-	-	-	3 160 820	109,730	
2n.16	Scaffolding in support of decommissioning	2	440	8	3	44	5		119	618	618	-		433	27		-	-	21.916	13 697	
2a.1	Summal Period 2a Activity Costs.	- 25	15 235	8 854	3 035	8410	45 175	420	26 540	108 397	106 049	-	2 349	85 545	51 318	3 125	517		10 042 880	257-349	4.27
Period 2w	Colinteral Costs																				
2a 3 †	Process liquid waste	64		26	77		113		.74	354	354			-	436		5	=	26-139	85	-
28.3.2	Small tool allowance	-	192						29	221	199		72		-	9	=	-	-		-
28:3.3	Spent Fuel Capital and Transfer	1.0				-	-	449	<b>\$7</b>	516		516	-	8		2		4		*	-
28.3.4	Survey and Release of Scrap Metal	170			1.5			329	49	379	379		-	2		-	8				
29.3	Subtotal Period 2a Collateral Costs	64	192	26	77		113	778	220	1.470	932	516	22		436	9	Ε.	8	26 139	85	-
Penad 2a	Period-Dependent Costs																				
2a.4.1	Decon supplies	78	-	-		7.57	5-6		19	97	97			-	-		-		(6.1)	-	
2a.4.2	Insurance			-			-	461	46	507	507	-		-	-		-	-	-	-	
2a 4.3	Property taxes					(4)	(*)	1.510	151	1,661	1.495		165	-	-		-	-	-	-	
28.4.4	Health physics supplies	191	1 760		7-6			10	440	2 200	2.200	-	11-27		-	-			-	-	
2a.4.5	Heavy equipment rental	141	3 164		-		(=)		475	3 639	3.639		-	-			-	-			
24.46	Disposal of DAW generated	140		67	56	150	166	y=1	56	345	345			-	3 935	-			78 703	143	
2a 4.7	Plant energy budget	101	-	2	14		-	1,809	271	2.080	2.080	140			-	-	-				160
2a.4.8	NRC Fees	12		2		(2)	-	947	95	1.041	1.041					-		-	-	-	181
28.4.9	Emergency Planning Fees.		-	2			192	404	40	444		444		-	2	-			(-1)		
2a.4.10	Spent Fuel Pool O&M		2					1.072	161	1 233	2	1.233			2	-				2	
2a 4 11	Liquid Radwaste Processing Equipment/Services			2	1	120		270	40	310	310		_			9			-	2	147
2a A 12	Indirect Overhead			1	100	100	200 (a)	3.727	559	4.285	4.286		2			9	2	2		2	-
2a.4.13	Security Staff Cost	-		-			121	824	124	948	948				-		4				32.260
28.4.14	Lithity Staff Cost	-		-	15		100	35 €01	5.340	40 941	40 941				3	e	2				622.500
28.4	Subtotal Period 2a Period-Dependent Costs	78	4 924	67	56		166	46 623	7.818	59,731	57.888	1.677	166		3.935				78,703	143	654,750
2a.0	TOTAL PERIOD 2a COST	865	20 352	8 946	3 166	8.410	45 456	47.822	34.578	169.598	164.868	2.193	2.537	86 540	55 689	3.125	517		10 147 720	257,576	659.021

Table C-1
Oconce Nuclear Station - Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial \	olumes		Burial /		Utility and
Activity Index	Activity Description	Decon	Removal Cost	Packaging Costs	Transport Costs	Processing Costs	Disposal	Other	Total Contingency	Total	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt. Lbs.	Craft Manhours	Contractor Manhours
PERIOD	b - Site Decontamination																			1	
Period 2b	Direct Decommissioning Activities																				
Nennest	of Plant Systems																				
	Companent Cooling		47					-	7	54		-	54							1 374	
	Component Cooling RCA		116	2	3	130			49	300	300	-		1 430					56.079	2 674	
	Core Flood	*	109	8	17	141	50		84	389	385			1611	261				88 748	2 795	
	Electrical (Clean)	-	563	7	13	44.00	74		97	670	400.00	-	670	210					***	16.347	-
	Electrical (Contaminated) Electrical (Contaminated) RCA		193	20	36	1 381			62 513	450 3.143	450 3.143	-		910 15.179	376	-			70 710 516 410	4 751	
	High Pressure Injection		892	239	314	1.156	2012		970	5.584	5 584			12.713	10 304				1 439 297	28 392 22 837	
	Incore Instrumentation		17	-0	0	1194	1	2	27.59	25	25		-	14.114	13				1.168	466	
	Low Pressure Injection		518	58	35	518	506	9	352	2.037	2.037			5.597	2772				463 289	13 232	
20.3.3.10	On-Site/Off-Site Power		94		-			-	7.4	108		-	108				-	-		2:517	
20.1.1.11	Purge		149	**	17	440		2	106	712	712	2	-	4,842					196 641	3 591	
	RFS Retueling Water	-	45	4	4	29	25	- 2	23	129	129			314	127		-	9.	24.146	1 070	
	Radiation Instrument Alami		11	-	-	*		*	2	13	-	*	13	-			•			323	
	Radiation Institument Alarm RCA		20	0.	0.00	. 9	-		8	2.471	2 471		-	63		-		-	2.565	788	
	Reactor Building Cooling Reactor Coolant		345	25	44	1.789	129		351 104	561	581	-	-	18.T45 510	663		-	-	761,247 80,040	8 761 6 272	-
	Reactor Coolant Storage	435	497	54	71	221	459		506	2.243	2.243		-	2.430	2 696				309.234	21 804	
	Ventilation (Clean)	-	172		-	441			26	198	2.277		198	2.74313	2.000		-		200 234	5 298	
	Ventifation (Contaminated)		583	16	28	808	50	-	285	1 769	1.769		-	8.878	255		-	-	383.438	13 303	
20.1120	Ventilation (clean) RCA		242	7	12	448			130	838	838		(*)	4 925					300.000	4619	
2b 1.1	Totals	435	6.075	459	650	7 118	3.307	-	3.684	21 738	20,694		1 044	78 247	17.46	*			4 694 512	161 122	
26.12	Scaffolding in support of decommissioning		550	10	-2	55	.7	-	:149	772	772		**	542	34	-			27,395	17:122	
	enation of Site Buildings																				
	Reactor Building	770	960	152	271	4/4	971	-	965	4.443	4.443		-	4.658	10.890		-		941.440	37 959	
2b.1.3.2	Auxiliary Building	315	180	40	73	57	103		253	1.020	1.026	-	-	629	2 849				221,767	11 851	
	Turbine Building Totals	1 312	1.064	5	8	481	1 080	-	1342	400 5.872	400 5.672	-		5 286	14 053	-			1 184 915	6.496	
2ы.т.3				237	352							-				-	-			56 106	
26.1	Subtotal Penod 26 Activity Costs	1 747	7 689	715	1 004	7 653	4 398		5 175	28 382	27 339		1 044	54 075	31.554	-	•	-	5 906 822	234 350	
	Additional Costs																				
2b.2.1	Containment Paint Remediation	92	-		12		84		69	264	264	*			452					800	
20.2	Subtotal Period 2b Additional Costs	92			12		84	•	59	264	264	*	-		452	•		•		500	
	Collateral Costs								0.50		100				. 25.				1000	389	
20.3.1	Process Iguat waste	135	4.000	64	191		31e		181	167	667	- 1			1.079				72.920	210	
26 3 2 26 3 3	Small tool allowance Spent Fuel Capital and Transfer		163		-	-	-	611	24	702	187	702		(.5)			-	-			
2b 3 4	Survey and Release of Scrap Metal						-	412	62	474	474	1.60				•		-			•
26.3	Subtutal Period 2b Collateral Costs	135	163	54	151	-	316	1.023	359	2,250	1.548	702	-		1.079	-			72.920	210	
Petiod 2t	Period-Dependent Costs																				
20.4.1	Decan supplies	790	-						197	987	997		1-1				-		-		-
2b.4.2	Insurance							657	66	723	723		-			140					
7n 4.3	Property taxes				-	-	(4.5)	1.854	185	2.040	2.040		190	>=				9	-		
2n 4.4	Health physics supplies		1.850	140	-		14.1		465	2 325	2,325		-			(*)	-				
70.45	Heavy equipment rental		4.482	-	57	-			672	5 154	5 154		-	-	4.000		-		00 70 -		
26.4 fi 26.4 T	Disposal of DAW generated			-,3	37		170	2.037	58 306	354 2:343	354 2 343		-	-	4 038	120	-		80.764	14"	
2b 4.8	Plant energy budget NRC Fees			-				1.351	135	1.486	1,486		-								*
-	C. C	-					-	1 000		1,400	1.74942			-					-		

Table C-1 Oconce Nuclear Station - Unit 1 DECON Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	olumes.		Burial /		Utility and
Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	Other	Total Contingency	Total Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt. Lbs.	Craft Manhours	Contractor Manhours
Pénad 2t	Period-Dependent Costs (continued)																				
2h 4.9	Emergency Planning Fees	2		-	2	-	2	576	58	634		634			-	-	-	-	-	2	12
2b 4:10	Spent Fuel Pool O&M	÷			*	-	-	1.530	226	1,759	445	1.759	-	-		-	-				-
2b.4.11 2b.4.12	Liquid Radwaste Processing Equipment/Services Indirect Overhead		-	5	5			385	58 567	443	443 4,346		-	-	-	8		- 5	-	7	
26.4.13	Security Staff Cost							1 175	176	1 352	1 352		2			- 1	ů.	-	-	-	46.010
26.4.14	Utility Staff Cost		200		-	-		35,360	5 304	40,663	40.663		-					2	-		631 300
2b.4	Suptotal Period 2b Period-Dependent Costs	790	6.342	85	5.7		170	48,705	\$ 475	64 505	62 215	2.393	ě	-	4 038	-		Ε.	80.764	147	677 310
26.0	TOTAL PERIOD 26 COST	2.763	14 193	654	1.265	7.653	4.968	49.72	14 880	95 504	91,365	3 095	1 044	84.075	37 124	-	-	-	6 060 506	238 507	617,310
PERIOD	2c - Delay before Wet Fuel Storage Decontamination																				
Period 2d	Direct Decommissioning Activities																				
	Collateral Costs							120 (64)	200												
2c 3 1	Spent Fuel Capital and Transfer Subtotal Period 2c Collateral Costs	-	**	-	-			2 432	365 365	2 797		2,797	-	*				-	=		-
26.3	Subtotal Period 2c Conateral Cosis	-	-		-	-	-	2.432	300	5.197		2 (8)	•	•		-	-	-	-	•	
Period 2d 2d 4.1	Period-Dependent Costs Insurance							2 371	237	2,608	120	2,608				2					121
20.4.2	Property taxes	- 2		- 1				1 380	138	1 518	2	1 518				9	- 1		-		
2043	Health physics supplies		V- 2	-	-	-	1.51		172	858	5	858	-	-	- 1			-			
20.4.4	Disposal of DAW generated			15	12	*	35		12	75	15.	75	-	-	5.12				17 190	31	
2c 4.5	Plant energy budget	120		-		=	100	1 858	294	2,253		2 253		-			-		•		-
2c.4.6 2c.4.7	NRC Fees Emergency Planning Fees	-		-		-	100	1.350	135	1.485 2.286	1.5	1.485 2.286	-	(4)		-	-	-			-
20,4.8	Spent Fuel Pool O&M						-	5.516	827	5 344		B 344		-		-	- 0				
2c.4.9	Indirect Overhead	-		-	-	-	1-1	1.910	286	2 198	-	2,196		-			-	-		-	
	Security Staff Cost		- 1	-		-	141	9.720	1 458	11,178	: *	11,178	-	-			-				327 979
	Utility Staff Cost	1 -	-	The last		*	-	17,678	2,652	20,330		20,330	-	-		-	-	-		9.7	319 027
26.4	Subtotal Period 2c Period-Dependent Costs	-	686	15	12	-	3E	43.963	5.419	51,131		51,131	-	-	859	1		-	17,190	31	647,005
25.0	TOTAL PERIOD 26 COST		686	15	12	12	36	46 395	6.784	53.928	141	53.926	ħ.		859		¥	-	17 190	31	647 005
PERIOD	2d - Decontamination Following Wet Fuel Storage																				
Penod 2d 2d 1.1	Direct Decommissioning Activities Remove spent fuel racks	314	32	122	68		479		307	1 322	1 322	127			2 450				219 804	956	
		5(4		122	00		4,5		301	1.044	, Va.				2 -30				210 000	200	
	of Plant Systems	253	245	24	36	150	200		275	1,211	1.211			1,644	1.208				171,618	9.335	
20.1.2	Spent Fuel Cooling Totals	253	245	24	36	150	229	-	275	1,211	1.211			1 544	1 208	-	-	-	171 518	9 335	
Decontan	nination of Site Buildings																				
	Fuel Building	202	226	5:	8	. 53	12	-	175	711	711	-	-	916	227				53.074	19 113	
2013	Totals	202	226	5	8	63	12		175	717	711			916	227		-	*	52.074	10 113	
2tt 1 4	Scaffolding in support of decommissioning	-	110	2	0	11	1		30	154	154	**	-	108	7	-			5 479	3 424	-
2d.1	Subtotal Period 2d Activity Costs	769	613	154	112	244	721		787	3,399	3.399	345	¥	2.667	3 891	-			449 974	23.828	
	Additional Costs																				
2d 2.1 2d 2	License Termination Survey Management Program Subtotal Period 2d Additional Costs	(4)				121		616 516	185	801	801 801	-		14 T	-	-	*				6.240 6.240
44.2	STREET AND AN ADDRESS OF THE PROPERTY.	-	-		-		-	5 (5	103	001	041	-	-			-				•	0.240

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Table C-1
Oconee Nuclear Station - Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	/olumes		Burial /		Utility and
Activity						Processing	Disposal	Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A				Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
Period 2d	Collateral Costs																				
20.3.1	Process liquid waste	97		64	193		377	4.1	178	910	910		-		1.086				86 853	212	-
	Small tool allowance	-	23	17.00	*		-	-	3	26	26		-							100	
	Decammissioning Equipment Disposition		-	109	.29	605	73	-	124	940	940	•		6.000	373				303 507	88	-
	Spent Fuel Capital and Transfer	-	•		-		-	147	22	169	•	169	-				-				
	Survey and Release of Scrap Metal						100	82	12	95	95		-					-	200		
2d 3	Subtotal Period 2d Collateral Costs	97	23	173	223	605	450	229	343	2 140	1.971	169	-	6 000	1.459	•			390.380	300	
	Period-Dependent Costs																				
	Decon supplies	62	100	-		-	-		15	. 77	77				-	-	-	1.5			
	Insurance		(*)	-	0.00			769	17	166	186			-	-			-			
2d.4.3	Property taxes				- 1		1.00	3	0	4	4.			-			-			-	-
24.4	Health physics supplies	-	302		-	-	1-1	-	76 173	1.328	378 1 328			-			-	1.0	-		
24.4.5	Heavy equipment rental		1 158				3€		12	73.	71		-	-	538		1.00		16.783	- 21	
24.4.9	Disposal of DAW generated			142	1.2		35	280	42	322	322				529	-	-		19.103	.51	
2d 4 T 2d 4 B	Plant energy budget NRC Fees						-	348	35	383	383						-				
20.4.9	Emergency Planning Fees				-		-	149	15	163	553	163					- 1				
	Liquid Radwaste Processing Equipment/Services	-					-	198	30	228	228	155			Ţ.				-		
	Indirect Overhead						-	604	91	695	695										
	Security Staff Cost		-		-			88	13	98	96										3.309
	Utility Staff Cost					-	-	9.601	840	6 441	6.441	-	14								100 911
2d 4	Subtotal Penod 2d Penod-Dependent Costs	62	1.457	14	12		35	± 438	1 359	10.377	10.214	163			B38				16 763	31	104 220
20.0	TOTAL FERIOD 28 COST	928	2 093	341	346	849	1 206	8 284	2.671	16 [18	16 386	332	1.5	8 667	5 189		*	-	857 097	24 159	110 460
PERIOD 2	2e - License Termination																				
Daniel Su	Direct Decommissioning Activities																				
	CRISE confirmatory survey							150	45	195	195		_								_
26.1.2	Terminate license				-			1,210	и.,	100	192										
2e 1	Subtotal Period Ze Activity Costs							150	45	195	195										
										-	(4.5)										
	Additional Clists																				
	License Termination Survey	-	1-1		-			5.445	1.633	7.078	7.078			-	-	-	-	*		135 747	
26.7	Subtotal Period 2s Additional Costs							5.445	1 932	7.078	7.078			-		-	-			135 747	3.120
Period Je.	Collateral Costs																				
26.3.1	Spent Fuel Capital and Transfer				-		-	37	- 6	43	40	43	-	-	-	-				-	142
2e 3	Subtotal Period 2e Collateral Costs		-		-	1	-	37	6	43	*	43				-	-			-	
Period 2e	Period-Dependent Costs																				
2e.4.1	Insurance			91			1.5	217	22	239	239			-	-	-				-	-
2±4.2	Рторету (ахия			1			-	5	0.	5	5	*		-					-		-
3e.4.3	Health physics supplies		836	-	9.0	4	8		:208	1.044	1 044				*			*	100	5.00	
	Disposal of DAW generated	2		5	1		13		5	28	28	•			315:			*	6.299	11	•
2e.4.5	Plant energy budger	¥		-	8	*		199	30	229	229		-				-		*		•
2e 4.6	NRC Fees		100			5	5	532	5.3	585	585					-	7				•
2e,4.7	Emergency Planning Fees			7.1	-	-	-	25	3	28	5.00	28		•					-		
204.8	Indirect Overhead	*	125	9.0		3		414	62	476	476						-	*	-		
24.4.9	Security Staff Cost			31	-	=		122	.18	140	140								-		4.714
	Utility Staff Cost					-		4 050	609	4,669	4,669	- 20	-	-	245	-	-		14.500		69 143
2e.4	Subtotal Period 2e Period-Dependent Costs		836	5	4		13	5.574	1.011	T.443	7.415	28			315			-	6.299	11	73.857
2e 0	TOTAL PERIOD 2e COST		8.38	\$	4		13	11.20€	2 895	14 759	14 689	70			315				6.299	135.759	76 97
			36 160	10 162																	

TLG Services, Inc.

Table C-1
Oconce Nuclear Station - Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

$\overline{}$						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial \	olumes .		Burral /		Utility and
Activity		Decon	Removal					Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft.	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
PERIOD :	3b - Site Restoration																				
Penad 3a	Direct Decommissioning Activities																				
	n of Remaining Site Buildings																				
	Reactor Building		4 114	-	-	-	1.5	259	617	4.731		•	4,731		-	-	8			53 465	
	Auxiliary Building	25	926	7	5	7.	151	372	124	950			950		ä	8	*	3	-	12.013	. T.
	Turbine Building	100	1.762	-		(2)	101	0.51	254	2.025	101	50	2,026		a				50	31,130	
3b. 1.1.4	Turbine Pedestal		262		5	51	171	100	39	301	-		301	-			=	=	-	3.192	
3b.115	Fuel Building		1548	=	-	-	181		97	745	100	(5)	745	-	-	-	-	-	-	9.163	-
3b 1 1	Totals	1-	7.611	•	-	15	1.51	-	1.142	8.753		-	8.753	-	-				-	108,963	*
	eout Achvities																				
30.1.2	Grade & landscape site		112	-				-	17	129	141		129	-	-	-	-			250	
3b.1.3	Final report to NRC				-	-		106	16	121	121			-	-	-	-	-			1,560
3b,1	Subtotal Period 3b Activity Costs		7.723	-	-	*		106	1.174	9 003	121		8,882	•	-	-	-	-	-	109,213	1 560
Period 3b	Additional Costs																				
3b.2.1	Concrete Crushing	1.0	270	-	2	-	121	2	41	313	(4)	2	313	-		¥	2	2		1,376	
35,2	Subtotal Period 3b Additional Costs	120	270	÷	2	020	021	2	41	313			313	-	٠	٠	9	٠	-	1,376	
Period 3b	Collateral Costs																				
35.3.1	Small tool allowance	18	79	-	-	2.E	671	671	12	91			91		8		-	8	14.		(5)
36.3.2	Spent Fuel Capital and Transfer		-	-			100	159	24	183	-	183	-					-		-	100
3b.3	Subtotal Period 3b Collateral Costs	166	79		-	16	150	159	36	274	20	183	91		-		-	-		-	
Penod 3r	Period-Dependent Costs																				
3b 4.1	Insurance				-	-	180	668	67	735	0	661	73	-		-	-	-	-		161
3b.4.E	Property taxes	-	-		-	100	-	15	2	17	-	-	17	-	-	-	-	-	(*)		
36.4.3	Heavy equipment rental	190	6.792	-	_	1-		-	1.019	7.811			7 811		-	-	-	-	-	-	-
3b.4.4	Plant energy budget	141	100	-	-	14		307	46	353		318	35	-	-			-		-	141
35.4.5	Emergency Planning Fees	(4)		(4)	-	(-)	-	77	6	85		85			-				-		160
3b.4.6	Indirect Overhead	100	-			-	~	739	111	850	850	-	0.81	-	-	-	-	-		-	(w)
36.4.7	Security Staff Cost	100	_	-		4-2	-	160	24	184	D	129	55		-						5.850
3b.4.8	Utility Staff Cost	191	-	2	9	12	1.0	6.888	1.033	7.921	D	7 129	797	· ·		2		2			123.420
36.4	Subtotal Period 3b Period-Dependent Costs	12	6.792	-	-	Tu:	191	8 854	2 309	17 955	850	8 322	8.783	-	-	-	-	-		-	139 470
3h 0	TOTAL PERIOD 36 COST	-	14 864	-	-	36	14)	9 121	3.560	27 545	971	8,505	18 058	÷		2	2	2		110 589	131 030
PERIOD '	3d - GTCC shipping																				
Period 3d	Direct Decommissioning Activities																				
Nuclear 5	team Supply System Removal																				
	Vesset & Internals GTCC Disposal	(-)	-	-	-		9.749		1.462	11.212	11.212		-	-				440	79.546		
3d.1.1	Totals		100			1.5	9.749	00	1.462	11.212	11 212	-		-				440	79.645	-	181
3d †	Subtotal Period 3d Activity Costs	1.61	-		-	3.63	9.749		1.462	11.212	11.212	-		*				440	79.646	•	
3d 0	TOTAL PERIOD 3d COST			-		-	9 749		1.462	11.212	11.212	•					-	440	79.546	-	180
PERIOD:	TOTALS	(4)	14 864	7-3	-	V.	9 749	9 121	5 022	38 756	12.183	8 505	18 068		-	-	-	440	79 646	110 589	131 630
TOTAL 0	OST TO DECOMMISSION	7.412	58 394	10 ⊒36	5 264	16 912	66.007	247.889	50 343	492 457	398 442	71 528	22 487	179 283	126 796	3 887	517	440	17 614 750	619 459	3 198 307

TLG Services, Inc.

#### Table C-1 Oconee Nuclear Station - Unit 1 DECON Decommissioning Cost Estimate (thousands of 2008 dollars)

1000						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial \	olumes		Burial (		Utility and
Activity		Decon	Removal	Packaging	Transport	Processing	Disposal	Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours

TOTAL COST TO DECOMMISSION WITH 19.5% CONTINGENCY:	\$492,457	thousands of 2008 dollars
TOTAL NRC LICENSE TERMINATION COST IS 80.9% OR:	\$398,442	thousands of 2008 dollars
SPENT FUEL MANAGEMENT COST IS 14,5% OR:	\$71.528	thousands of 2008 dollars
NON-NUCLEAR DEMOLITION COST IS 4.6% OR	\$22,487	thousands of 2008 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING STCC):	131,200	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED	440	cubic feet
TOTAL SCRAP METAL REMOVED:	43,796	tons
TOTAL CRAFT LABOR REQUIREMENTS:	819.459	man-hours

End Notes

n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
a cell containing " - " indicates a zero value

Table C-2
Oconee Nuclear Station - Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial	/olumes		Burial /		Utility and
Activity				Packaging		Processing	Disposal	Other	Total		Lic, Term.	Management	Restoration	Volume	Class A	Class B	Class C		Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet		Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
ERIOD 1a - Shutdow	n through Transition																				
eriod 1a Direct Decon																					
	diminary decommissioning cost.		-		1.5	-	100	38	5	43	43		-	-	-			1	-		556
	of Cessation of Operations									3											
	el & source material									n/a											
	of Permanent Defueling																				
	plant systems & process waste d submit PSDAR							58	9	67	67			_							858
	ni dwtte & specs	-			-	-	-	133	20	153	153	_				-			_	-	1.968
	tailed rad survey							.00	2.0	ā	13.65										7.040
	-product inventory	527					141	29	4.	33	33		14		-	-	-		-	-	428
a 1.10 End product				72			4	29	4	33	33				-	2	1.0	12			428
1a 1.11 Detailed by-	-product inventory	-		12	-	12	-	38	6.	43	43	-	121	2	-	2	2	-		2	555
	or work sequence		Ξ.	12				217	33	250	250		20			2	2	10	12	-	3:210
ta 1.13 Perform SE		-	8	-		28	-	90	13	103	103	3			-	2				-	1 327
ta 1 14 Perform Site		-	8				-	145	22	166	166	-	1-	2	=	-	3		9	- 1	2.140
	omit License Termination Plan					(8)		119	18	136	136	-	(6)			-				5	1 793
la 1 15 Réceive NR	C approval of termination plan									a											
Activity Specifications																					
le 1 17,1 - Plant & terri					-		100	142	21	154	147		16		-	100		1.5	i <del>e</del>		2.106
1s.1.17.2 Plant system		-	-					121	18	139	125	-	14	-			1.5	1 *	-		1.783
1± 1 17.1 NSSS Deco		-	-	(16)	-			14	2	17	17	-	(*)	-	-	:-		-	-	-	214
Ta. 1.17.4 Reactor inte		7.00	-	-	1-1	1-0	1-1	206	31	296	236	-		-	-	-		-	-	-	3.039
1a 1,175 Reactor ves			-		-	-	-	188	28	216	216 17		-	-	-	*			-	-	2.762
ta 1.17.6 Biological st ta 1.17.7 Steamgene								90	14	104	104		-		-	-	-	-	-		1.335
ta.1.17.8 Reinforced				100				46	9	53	27		27								685
1a 1 17 9 Main Turbin			Ţ.				-	12	. 2	13	-		13						-	-	171
1# 1.17.10 Main Conde					-	-	157	52	7	13	12		13	2	-	12	2				171
1a 1 17 11 Plant structs			- 2	-		-	121	90	14	104	52		52		-	100	-			2	1,335
1s 1 17 12 Waste mans		-	2	-	-	-		133	20	153	153	27	-		-	12	- 2	-	2	#	1 969
ta 1 17 13 Facility & sit			-					26	a.	30.	15	(2)	15		=	-	- 9		-	-	385
tu 1 17 Total			5	3		351	•	1.005	164	1 259	1 109	27	150		3	-	2		-	*	16,190
Ptanning & Site Prepara																					
19 1 18 Prepare disr		-		-		~	-	69	10	80	50	-		-	-		-				1 027
1a 1 19 Plant prep 4 1a 1 20 Design water		17	-	-		0.00		2 700	405	3 105 47	3 105			-	-	-	2		-		599
	er clean-up system nt. Ontit Envips/tooling/ets.	-	-	7.0	-	-	-	2 100	315	2 415	2 415			-	-	-		-	-		399
	sks/liners & containers	-	-			-		36	5	41	41	-			-	-		-			526
	riod 1a Activity Costs	-		-	-	-	-	6.935	1 040	7.875	7.625		150			-	-		-	-	31,566
Period 19 Additional Co																					
12.2.1 Asbestos Ri			2.759	1	283	(4)	2 154	197	1.273	6.481	6 481	-	12		25,455	-	-	-	330.915	35 451	
1#2 Subtotal Per	rind 1a Additional Costs		1750	1	283	-	2,164		1.273	5.481	5,481	~	-		25.455		-		330 915	35 451	
Period 1a Collateral Co																					
ta.3,1 Small tool a		*	42				-		6	48	48	-		8	-	12		-	-	2	
	Capital and Transler		÷					695	104	800		800		5	*	-		-	-	•	
1st 3 Subtotal Per	nod 1a Collateral Costs		42	-		•	-	696	-117	848	48	800		-		33		-	-	8	2
Period 1s Period-Deper	ndent Costs									200	0.55										
1a 4 1 Insurance			7.		-	-		775	7.7	852	852				1.5	-	- 5	-			-
1a.4.2 Property tax	11.15							1.712	171	1.883	1.883										

Table: C-2
OCOIH!! Mileleal: Station - Unit 2
DECON Decommissioning Cost Estimate
(thoughands of WOI8 dullars)

						Ort:511e	LIRVI				NRC	Sp(Int Fui1	SUe	Processed			/ошин:s		Ehnlall		Utility and
Activity		Occ(,n			?!IansDbfl	Plocbiolng	tl.pCi.sall	Omier	Ints/	TOBM	lie, Term.	Man3@ilmenl	RHADDfallton	Volume	CII;16\$ A	Oh,≰u8	CloinC	GleC	Proclined	Graft	Contractor
Index	Activity Description	(305f	Cost	Costs	C053	Costs	CostS	Costs	COllungracy	Centls	Costl.	COSIE	Cos.ts	Cu. Fills	Cu, F0G1	CU,FM!	CU Feel	Cu. Feel	WI., lbss_	Manhours	Manhours
eriod 1a	Period-Dependent Costs (continued)																				
1a.4.3	Health physics supplies		586		¥	.6			1.47;	713	7"3J	-	-	9			9			-	
13.4.4	Heavy equipment rental	9	∉Ufj			8	-		6.	S;E	;26	-	-		-				121	-	
1645	Chaposal At C-A0; jierMotelm(z		100	10	3	100	20	1.0	*	50	50	-			171	-		-	"o\B	21	
18.44	Pitoliti entiro;1 (cud.de;							II.s	199	152:	1,522	-			-	-			-		
344E 7	f.4 gFrH			-				471	710	518	S	-	-								-
11.4.8	Emergency Planning Fees	-	15				-	;9	28	3CIP	-	309		-	-	-			,		
1,000	tfMAFI!'U					8		'Zf	19	HE	145	-				-					140
19.4 le	Spent Reel Phot G&M	-						TUIT	112	857		857		-		-		-			
11.011	Indirect Collthaul		1941			2		2 135	320	2.18!:	2 455	-				-		- 2			Art I
ta Alt⊋	Security SIA" Cost				2			1 196-	•99	1 Juliol!	7 368		-								dl5 (;76
ta.4.13	U16ly Matt Cost		(4)	-	-		- 2	H/12.)0	Hite	21 128	22 125	(- •	4.5			-				-	JY:i609"
h. d	Studdintist Penod 1a Penod-Dependent Costs		; C22	10	3		24	27.996	4 261	33 345	32 178	22 122		2.7	311				11.419	21	Jj:J)\Sc
18.0	TOTAL PERIOD NaCOST	-	l:IJk.	16	291	-	tel);	35 tOt	E 585	43le.lb	al. !i.};	1,966	150		26 026				342 384	95,472	434 002
PERIOD	1b - Occaministaning Pretituations																				
	b Cited Decommission (Q 6,ct.) (6,																				
minus in	Direct producting type (1)																				
IfftLijj.tQ	Work procedures																				
	Plant Mustems		100	15.1	-		-	q:,	21	158	142	15	16			-	-		-	-	:02
)b 11:2	NSSS Decontamination Flush		(5)	-	-		-	29	4	<b>n</b> 3	n			180			-		200		426
'till't]	Reactor internals	200			-			72	79	83	R1			-		-				-	1:l1a
1b 1 1.4	Remaining euibJn;to		1.5		-			P	6	46	11		38	-	-	-		-		-	276
1t!"S	C;RD C(Jol,"Q asemb/li				-		-	۱۲.	44	3.1	13		-	1-1				-			4.310
10 t ; H	CRO housings & 151 tillbtl	-	2.5		-			29	4	11	11			-			-		-	-	428
10. t. 1. 7	Irrc.ore 11'IS';Lit'TWnUI-JI'		-		-	-	-	119	4	)1	13	-	-	-				-	140	-	#Ltd
1b t 1 !	Reactor settled		-	-	-	-	-	110	16	121	111			191				-			1 554
HIIIV"5	FilotJtydPl.tloO\I	-	-	140	-		-	35	5	0.0	20		20	141	-			-	9.0		514
1b 1 ""J	Munife shields	-	-	(4)	-		-	13	2	18	15		-		-	-	14	-			181
1611 1 17	eotllogaJ ahreig	9.0	2	140	-	2	2	35	5	-0	40	19	-	100	-			-	141	-	105:2
îti 1 1 12	618'simgetfield:Qash	-	-			-	-	13J	20	t5o)	15 1	12	Isu	-				-	(4)	-	1,969
11/1/1/13				-		-		20	4	)J	17	1-	17	-	-			-	-		4018
	\JanT""turiol			140	20			45	7	52	-	2	52	120	-		-	-			668
10.1 1 15	Main Condensers			121	-			45	1	5.	100	- 2	1,	120	-	20	27	-			568
	A.""Lar, Or, i'ldl.g				147		-	7i	12		80		S		-	22	20	-			1 168
In 1 1 12	RUl'ator!du.ldnlg	-				2		75	12	91	82		•	-			-	-			;_;&9
le," 1	T-allo.			-		9		962	144	1.107	898	-	:201		-	(8)	-				Hn
10 1 >	Decon primary loop	515		-					258	773	773		-					27	-	1.067	
Ie 1	Subtotal Ponco in Activity (jurts	515						962	du	1 880	161		::0101				20		100	1 05?	lo.cc.=:/
		313			-			202	uq.	1 000	101		.0101	-	-	-		-		1 03.	W-1000
	b Additional Costs								2	5	4 4-4										
16.2 1	;;Dtffotr: Jid Ffr>()OI[;;t;;o-j	100		0.53				4,>1	'119	5 :100	409				100		•		:::::::::::::::::::::::::::::::::::::::	10 524	
10.2.2	Site Characterization Survey			(*)	100		15	1,252	J'6	t f:8	16211		157				-			th,	3 357
1r:1	Subtotal Process Additional CBMs			(*)	(*)			5.956	: 00 t	• Q,	(0):			(5)	(4)			(2)		8.181	3.357
	p Collateral Costs																				
10:3 1	Etition equipment	8.61							1'.0:	I :IG	! CH	*		:51	170	*	-	2		*	
'o J:	Process liquicyastp	36		56	2.77	*	2112		hi.:P-	3 748	US:		-	100	188	*62			95.826	185	-
103)	5:19Uth 1501 allow 4 m.ou		- 1		(=)				<	1	,		(*1		387	-					(*)
10 j 4	Pips cultivit equipment	-	';,)Q	-	1-1	-		-	169	110	1 150			1-1		(*)			3.0		
10 J 5	Decan in	V:410)	-	-	(-)	-			• • • • • • • • • • • • • • • • • • • •	,"C	(61)	-		1-0	1 = 7				141		14
+b] -	Spill's Fuel Caputlit allet Transfer				(-1)			hj:-	24	18:"		18-"	-	-						-	12
t03	Subtotal Petrod Id Collateral Chills	31/13	1.001	-0				15:	* 136	":1)	• \I-I.	1167			196	762			95 826	195	

Table C-2
Oconee Nuclear Station - Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

				-		Off-Site	LLRW			-	NRC	Spent Fuel	Site	Processed		Burial V	/olumes		Burial /		Utility and
Activity		Decon	Removal	Packaging	Transport	Processing	Disposal	Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
Period 1b	Period-Dependent Costs																				
15.4.1	Decon supplies	27	-	-			10		7	34	34			-							
16,4.2	insurance			-	-			393	36	432	432	100		-	-		-		35.0		
1b.4.3	Property taxes	*	-	-	-	1.00		251	25	276	276		-	-	-		-	*		-	(5)
15,4.4	Health physics supplies	6:	240	-	-	191		100	50	300	300	-		-	-	=	-	*		-	-
16.4.5	Heavy equipment tental	1-1	232	-					35	267	257			-		-	-		*1		3.00
16.46	Disposal of DAW generated		-	5			14	-	5	29	29	-		-	328		-	-	6.551	*2	3-0
16.4.7	Plant energy budget	(*)	-	-	-		(*)	1.342	201	1.543	1 543				-	-	-	-		-	
1b 4.8	NRC Fees	1-1	-	-		-	-	239	24	.563	263		-	-	~	-	-	-	-	-	-
10.4.9	Emergency Planning Fees	**					-	142	14	157	-	157	-	-	-		-	-		·	16
10.4.10	FEMA Fees	-	-	-	-		-	54	10	. 73	73		-	-	-				-	-	1-
15.4.11	Spent Fuel Pool G&M	120	-	2	2		100	378	57	435	141	435	-	-	-	-		-			14
10.4.12	Indirect Overhead	141	-	2	12	120		1.329	198	1521	1.521	-	2	-	-	-	-	-			
10.4.13	Security Staff Cost	2		=	2	1.0	190	603	90	693	693		2	-	-	-	-	-	4		23 659
18:4 14	Utility Staff Cost	12	-		-			12 170	1 825	13.995	13 995	-			-		-	-	-		220 943
1b;4	Subtotal Period 1b Period-Dependent Costs	27	472	-7	5		144	16.904	2 591	20 018	19.427	591			328	-		-	6.551	12	244 602
Fe- 75	YOUN DEDUCE IN COST	5.075	1.473	25	1.77		* 305	72.746	5.000	20.407	35 181	778	208		516	762			100 576	9.431	202 107
10:0	TOTAL PERIOD 15 COST	2.855	1.473	62	1,66		2.381	23.985	5.230	36 167	32 101	.77.0	205	-	310	104		ñ	102 376	3 431	262.187
PERIOD 1	TOTALS	2.855	5.316	73	467		4.575	59 613	11.915	84 816	81,713	2.744	359	3	26.542	762	3	-	444.711	44 903	697 088
PERIOD 2	a - Large Component Removal																				
Penod 2a	Direct Decommissioning Activities																				
Nuclear St	teum Supply System Removal																				
	Reactor Coolant Piping	196	150	15	35		754	100	186	798	798				565	-	*	100	115 739	7.013	
	Pressunzer Rebet Tank	14	12	3	18	2	45		23	104	104	×3		-	188	-	-	36	20 849	612	
	Reactor Coolant Pumps & Motors	110	69	40	287	143	2.312	141	719	3.580	3.680			498	8 997	-	-		824 389	4.506	
	Pressurger	33	45	324			1.177		355	1.935	1.935	(4)		2	1.847	-	-	-	107 504	2 361	-
	Steam Generators	140	1.517	1 164	791		11.298	12	3.581	18 781	18 781	-	_	-	12.866	-	-		1.510,770	11.61£	1.167
	Refired Steam Generator Units	12		685	760		11288	-	3 004	15.737	15 737		2	-	12 855	_	-		1 810 770	5 400	758
	CRDMs/ICIs/Service Structure Removal	132	7.3	237	84		169		163	859	859	-		-	3.518		-		77.700	4.476	
	Reactor Vessel Internals	89	2.160	4 528	510		8 556	210	7 234	23.287	23.287	120	2		626	1.122	517		287 160	26 133	1.177
	Reactor Vessel	63	4 233	1.368	246		9 701	210	6 492	24.313	24 313				6.862	2.003		-	956 040	26 133	
	Yotals	738	8.560	# 365	2719	143		420	23 757	89 494	89 494	-		498	45 734	3 125	517		6 012 022	88 253	
Removal o	of Major Equipment																				
28.1.2	Main Turbine/Generator	(-)	308	259	78	727	354		322	2.088	2:088			3:819	2:127	-	-	-	515.468	7.674	
	Main Condensers	(*)	919	112	54	508	291		398	2 283	2.283	~	-	5.044	1 467	-	-	-	350 419	23 585	
Cascading	Costs from Clean Building Demolition																				
2a.1.4.1	Reactor Building	-	710	-	1-1		1.0	-	106	816	816	160		-		-	-	-	100	9.378	
28.1.4.2	Auxiliary Building		-92			(+)		1-1	14	105	105		-		-	-		-	(*)	1.333	
	Turbine Building		156		140	140	1-1	1=1	23	179	179	(40)		-	-	-	-	-		2.697	
	Fuel Building	121	70	_		1943	191		10	80	80	-		-	-	-	-	-	-	961	
	Totals	121	7 027	-	1=	-	*		154	1.161	1.181	-			-	-			1-0	14.370	
Disposal a	I Plant Systems																				
28 15 1	Chemical Addition	121	27	8	-	127		12	4	31	141	(2)	31	-	=	-			-	821	-
2a 15.2	Chemical Addition RCA	-	22	Q	3	20		12	9	52	52	<b>2</b> 0	-	222		2	2		9 0 1 6	501	
	Condensate		529	-	-	-			79	609		127	609	-	¥	2			40	15.699	
	Condensate (Contaminated)	-	601	39	71	2.764			580	4,055	4.055	-	2	30.383			2	2	1.233 881	15 479	
	Condenser Circulating Water	-	338	-					5.1	389	-		389					8		10.040	
	Electro Hydraulic Turbine Control		18	-		-		-	3-	20			20		9	9			2	499	100
	Feedwater & Emergency Feedwater		163	_			2	12	24	187			187	2	2		2			4.862	121
2a.1.5.7	recurator a cinergoncy recurator																				

Table C-2
OCOMC Newdlear Station - Unit 2
DECOM Decommissioning Crost Estimate
(thousands of 2008 dollars)

,						Orto6lle	LURRW				URC	Spot'll Fuol	Site	Processed		BUrial \	/oliumess		Burtal /		LiniQiilliU
Activity		Decon	Removal	Packaging			Dlfopoadl	Olne;	Total	Totul	Uc., fl/m.	Management	RetiOftiUOn	Volume	Clian A	Clasaaa	ClauC	Glee	Processed	Claft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	COS-L'S	CO\$ts	COfflingency	Consts	Costs	Courts	Cost!)	Cu. Feet	Cu. Feet	Cur.Æet	CU. Feet	Cu. Flert	WI., Lbs.	Manhours	Mainhauiti
Disposal i	of Plant Systems (continued)																				
Za 1.5.9	Feedwater & Emergency Feedwater RCA		297	,	13	438	~		127	820	t2r.			-1 1919	-		-	-	195 560	t ::.31	
2'e • 5 ttl	adlet w.a.rol	-	358		-	-	-		63	4:3			02.3			-		-	-	11 00	
2a.15.11	Healf!! Ot.a-f£ (Contaminated)		30)	7	H	.j&:!.			150	950	956			5.419				-	2:10 074	7.41;	2000
	I-t.ofti'l "enl		)"		-		-	-	5	16			10			-	*	-		1 002	
	High Pressure ExtHitton	-	L4		* 1	-	-	-	4	27	-	-	27	1-7	-	-		-	-	729	
24 1 5 4	IWCJrlilutr.O.!	141	. 3	-	-	-	-	-	0	J		*	3		-	-	-			75	
2a 1,5 15	Hydrogen		26	-		-	~		- 0	3J.			37			-	-			toll	
	Hynrl>gtl'll Sor+ Gil	*	10	-	•	-	-		•1	14	AL. 1		p.k	-	2#5	100	-			923	
	Lc.w Prtifos.u't £)/V.cl:Qn		345	-					5	41		*	41	-	-	-	-	-		'i C'if'o	
	Ma,", Slum		Ĥf		-		*	8	13	97		8	17		-	-		-		2.558	-
	MII'I Sten\ RCA		JoJ.a	J'	:5;;;	2.530		*	109	3,406	5-1105	*		0,808		-	-		1 129 284	;69"	-
	Post Accident Monitoring		15	1	3	1:		-	<del>1=</del>	IK)	80			.101	-	-	-	-	16 JO-1 as "'8	;-13S	
	Reactor Building Spray	•	11	3	2	19'			5.3	1B	335	-		; ,e.		•			as 8	=,10	-
	Recits Cooling Water   Shared 182		182		-	*	-		27	209			209			-	-			154	
	Recirc Cooling Water (shared 182) RCA	-	=))	2		155			<b>%</b> 5	)4)	3.40		-	1 127	-	-	-		0106	<b>=</b> 58-	
	Sample Montoring		114	8	13	2.'	95	-	84	298	298			244	438	-	-	-	4J QJC	J 1:)6	
	Stator Coolant	(4)	45		-	-	-		, I	69			50	-	-		-			1 507	100
	Steam thain		11		-	- 46			13	En			g,	420	(*)	-		-	24/245	H.6IJ	
	Six:10'\ Seal		48	1	,	45			19	:H1:	118	-	11a	223			(*)	-	2:(645	1 150	
7.101-e	TUO'A!!"O'		:21		-				31	13Si !3't				-	-		-	-		3 518	-
	Vacuum		4 2 8	111	Ž.	7 144	e:		1 )/175	13 765	13 207	-	1)1 2 558	7!111	øJE;				net 1J=	3 AUC 117 998	
2,:5	Totalla		4 1330	•11	"il";		C.		1 915	13 /05	.,		₹ 558		ore;	•	-		Het 13-	17. 398	
2s. H6	Scattoking in subsett of Over-timestoning	1-1	nut-	8	-	44	5		,n	640	e.J		-	,n	47		-		21913	14 299	
2m h	Subtotal Period 2a Acrorty Costs	738	5 525	9.556	3.04%	6.556	eg 567	420	7.6 "39	109,451	105 893		2 558	88,123	52 911	3 125	517	-	10 133 ISD	266.179	:, Z7 t
	Collateriil Costs, III																				
2m J 1	Pt(>(.ns.ltq)	65	Ann.	24	C8	141	125		7!	359	359	-	4	-	442		-	100	::"Cj.U'	å6	
:B 3:	Small tool allowar,co		198		527				30		205		23	-			-				2
211.18 7	Sipent FLHII ::::2lrtl="1.1"3 7."\\1\\1\\1\	-						3.10		391		391			12	-	-	-			×
2a HI	Survey artJ Release of Sutab t/ltml				-		7.0	_,r- n		ikoj.	4JJ			-							
21 3	Earthate Place (Califolia-ral Costs	es	195	26	79		***	=16	213	1410	9::t;'	J9!	23	•	442	4	-	-	26.531	36	*
	Penad-Dependent Costs																				
28.4.1	Decon supplies	61				(*)	-		16		-77		•		-	-		•	-	-	-
2442	Insurance	-		1.0	101			364		,0,	#31		7		-			-		-	-
2a 4.3	Property taxes							1.053		1 159	1 043		116		, <del>-</del>	-				-	-
28.4.4	Health physics supplies	7	1,522			181			415	1 )P.)	2.073		-	*		-					-
2a.4.5	Heavy equipment rental		2 501				Post		.1:1s	2 876	).676			-		-	-			-	
28.4.6	Ensposal of DAW generated			0.4	5.4		180	1	54	1J:	B33		-					-	75 757	138	
28.4.7	Plant energy budget			-				1.na		, 'M"	'6-'4		-	-						5-0	-
24.4.8	NRC Fees				(-)	-	*	512		564	564	· .	i e i	-						-	
28.4.9	Emergency Planning Fees				(-)	-		318		351	*	975		-				100	-		
28.410	Spent Fuel Fool O&M				-		*	545		975	2.45	975	-								
284.11	Liquid Radwaste Processing Equipment/Services					-	*	1'J		245 3388	;.45 . J8.:l			-							
28.4.12	Indirect Overhead				1-1			2 946		3.188	, J8.1 1WI		-	-	-	-			-	-	25 493
28 4 13	Security Staff Cost			-		-				71.90			-	-		-			-		.:l>,1:0'''
2n 4 14 2a 4	Unity Staff Cost	4.4	4-191	134	5.4		360	26 143 36 478		J; HiS	12:.16.3	i:1 <u>12</u> 5	113	-	4,000	-			75.757	598	
28.4	Subtotal Pencid 2a Peningi.Coiffict;\u/lint Costs	6.1	4"1;1	34			450	(KG (A) (C			NO I DH						-		19.191	:)117	937,204
24.0	·LJ'al PErico"sr	965	19 882	₹ 545	'e:	e', ∵	45 842	87515	13 150	158.05	153 EJ#4	15.0	2 60:6	8 <b>3</b> 327	5:" Dod	B 129	517	-	10 240 450	266 403	521 5hg

TL(, Services, Infe.

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Table C-2
Oconee Nuclear Station - Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

		-				Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial	/olumes		Burial /		Utility and
Activity		Decon		Packaging		Processing	Disposal	Other	Total		Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhouts	Manhours
PERIOD	2b - Site Decontamination																				
Period 2b	Direct Decommissioning Activities																				
Disposal	of Plant Systems																				
26 1 1 1	Component Cooling	100	47	1941	14	12	141	120	7	54	G#1	-	54			-			-	7.374	
26.1.1.2	Component Cooling RCA		116	2	3	930	(2)		49	300	300	-	-	1.430	-	-	0.00	-	58 079	2 674	-
2b 1 1 3	Core Flood	120	109	5	7.1	147	50	75	64:	389	389	-	-	1.611	261	×	-	-	88 248	2 705	
2b 1 1 4	Electrical (Clean)		583			120	127	0.3	87	670			670			-				16.348	
20 1 1 5	Electrical (Contaminated)		193	_	13	63	74	-	82	450	450	-	-	910	376	2	2	12	70.714	4.751	
20.1.1.5	Electrical   Contaminated: RCA		5 794	20	36	1.361			513	3 144	3 144			15 179	-	2	2	2	816 430	26 393	
26 1 1 7	Gasegus Waste Disposal (shared 182)		355	41	45	87	3.04	4	189	1.022	1 022	-	-	958	1,669	- 2	3		178 507	8.642	-
26.1 1 8	High Pressure Injection		893	239	314	+ 458	2.012		970	5 584	5.584		-	12 713	10:304	-		-	1.439.297	22.837	
20.1.1.9	Incore instrumentation		17	TI.	0		3.		5	25	25		-		13	-	-	-	1,168	466	
	Liquid Waste Disposal (Shared 132)	1.298	1.518	133	160	300	1.081		1.381	5 859	5.869	-		3.300	5.929	-		4	629 781	66 389	
	Low Pressure Injection		518	58	85	518	586	-	352	2 037	2.037	-	-	5.697	2 772	-			453 289	13-232	
	On-Site/Off-Site Power	-	94				-		1.4	108	-	-	108	-		-	-	-		2.517	
26.1.1.13			149	7.	11	440	(a)		106	712	712	-		4 842		-			196.641	3 591	
	RFS Refueling Water		45	a a	4	29	95		23	129	129	-	-	314	127	-	-	-	24 145	1.070	
	Radiation Instrument Alarm		11				-	-	2	13			13	-	-		-	-		323	
	Radiation Instrument Alarm RC4		29	it.	5	5			6	42	42		-	63	-	_		-	2 565	788	
	Reactor Building Cooling		345	25	4.4	1.705			361	2.471	2.471		-	18 T45		_	-		761 247	8.761	
	Reactor Coolant		241	21	19	45	129	-	104	561	561	_		510	663				80 040	6.272	
	Reactor Coolant Storage	435	497	54	71	221	459		506	2 243	2 243			2 430	2 696	_			309 234	21 804	
	Ventilation (Clean)	433	172		100				26	198			198	2 -00						5.298	
	Ventilation (Contaminated)		583	165	28	808	50		285	1.769	1.769	-		8.878	265			20	383 438	13 303	
	Ventilation (clean) RCA		242	7	12	448	-		130	838	838			4 925		-			200.000	4,619	
2b. 1. 1	Totals	1.733	7 947	543	856	7.505	4.692	- 5	5 254	28.629	27 585		1 044	82.506	25.066	- 5	-	-	5 502 825	236.156	
20. 1. 1	rotars	1.1.20																		1	
26.1.2	Scaffolding in support of decommissioning		572	10	2	96	7		154	500	800	•		542	34	=	-	*	27 395	17 873	
	nination of Site Buildings																				
	Reactor Building	770	860	182	271	424	971	(*)	965	4 443	4.443		-	4.658	10,690	5	-	100	941 440	37.959	-
26.1.3.2		315	182	49	73	57	103	(*)	253	1,029	1 029			629	2,849	-	15	100	221 767	11 651	
26.1.3.3		209	24	5	. 8	7	51		115	372	372		-	40.00	314	-	5	0.50	21,708	6,005	
2b; 1.3	Totals	1 294	1 064	237	352	481	1 085	-	1 333	5.844	5 844		-	5 286	14 053	-	-	-	1 184 915	55 616	
20:1	Subtotal Period 2th Activity Costs	3.027	9,583	869	† 210	6.041	5.789		5 741	35-273	34,230		1.044	58.333	39,153	-	71-		6.715.135	309.645	
	Additional Costs																				
2b.2.1	Containment Paint Remediation	92	-	7	12	-	84	-	69	.264	264		-		452		14	1.00	-	800	
2b.2	Subtotal Period 2b Additional Costs	92		0	12	-	54		59	264	264		-	-	452		-	-	*	800	
	Collateral Costs																				
2b, 3, 1	Process liquid waste	209		129	388	-	735		359	1.820	1.820	÷	-	2	2 179	- 1	-	2	169 359	425	121
20.3.2	Small tool allowance		215	-	-		-		32	247	247		-	-		=	-	-	-	-	
2b.3.3	Sperit Fuel Capital and Transfer	-		-			-	604	91	695	-	695	12		-	5	-	-	3.1	-	120
26.3.4	Survey and Release of Scrap Metal						- 1	471	71	541	541			¥			Ξ.	-	No. of Street	-	121
20.3	Subtotal Period 26 Collateral Costs	209	215	129	388	*	735	1.075	553	3 303	2.608	695	18	-	2 179	-	15	*	169 359	425	
	Period-Dependent Costs																				
2b.4.1	Decon supplies	786	5			(*)	-		196	982	982		15	*		5.	-		-	-	-
26.4.2	Insurance	-		100		3-3	-	656	66	F24	724	<del>=</del> 0				-			-	-	-
20.4.3	Property taxes	-		-		9.0		1.691	169	1.861	1.861	.=0	1.5	-		-	15		-		
26.4.4	Health physics supplies	-	2.182		-	1-1	-10	-	545	2,727	2.727		1.5	-		4			*	-	1.01
2h 4.5	Heavy equipment rental		4 486	-		-	-	-	673	5.161	5 161			-		-	-		400	-	151
2h 4 6	Disposal of DAW generated	-	-	80	8.7		200	-	68	415	416				4.752	-4	-		95 035	173	

Table C-2
Oconee Nuclear Station - Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity	y Activity Description	Decon	Removal F	Packaging	Transport Costs	Off-Site Processing Costs	Disposal Costs	Other	Total	Total	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Class A C	Burlal Volumes Class B Class Cu Feet Cu Fe	U to	GTCC P	Burial / Processed	Craft	Utility and Contractor
Penod	Penod-Depende						1	ı						1				1	1		
25.47	Plant energy budget	,	,		,		,	2.040	306	2,346	2,346	4	,	,	×			ě	,		3
20.4.8	NRC Fees			,		,		976	C)	1.019	1019		2	1	o .	,	í				¥
28.49	Emergency Flanning Fees	,	,					179	200	635		635	. :	j i	a :		in .				
26.4.10					1 0			386	1000	4.63	2.2.7	2011				, ,					
30.4.13			,		э	14		3784	568	4 352	4 352		э	- 3	100		٠	3	o 3		
28 4 13					2.04	a he	7 17	1.177	1.	1354	354		8 10				10	e r		- d	46 071
20.4.14				a				35.407	5311	40.718	91,718		100	- 100					r		632.143
H 4	Subtotal Penad 2b Penad-Dependent Costs	99	6,670	9	1.0	٠	200	48 578	6.517	64 499	63 103	al contract			120				95 035	173	878.254
io fi	TOTAL PERIOD 26 COST	4.113	6,458	106	1.00	20.00	5.802	49.253	15.880	103.340	300 56	3.081	1 534	BB 333	48 535	c		r	6 579 529	311 042	415.378
PERIOD	PERIOD Zc Delay before Wet Fuel Storage Decontamination																				
Period 2	Person 2c Direct Decommissioning Activities																				
Penad 2	Period 2c Collateral Costs.			,				8	956	3,683		6	,			,	,	,	,	,	
203	Subrotal Period 2c Collateral Costs.				,			in in	350	2.662	÷	2 683									
Penad 2	Penad 2c Penad-Dependent Costs																				
- 6 P	Drough them					a :		225	20.1	2.481	¥ ·	2.481		,			n 1	9 5			
20.00	staulth officers somelies		200					21.7	9 14	2000		17 TO 18		1 2			. 0	. :			) )
20.44	Disposal of DAW generated			4.	Ç	- 31	25		200	C		P	. )	5	80	,	- 11		18,356	30	6 10
37.75	Plant energy budger	1.0	4	à				- 10 E	280	2,144		2 144	1	. 1			- 11	111			100
25.4 B	TARC FRES			4	9	×		Ci.	Đ,	1351	×	1,32,1	æ	x	*			×		×	18
47.5	Shares II. al Doug Own						no 0	# E	0 0	. E		2.125							i,	c	E.
20.4.9						c (s		1.0	ť;	380		2.089	c e				E 6	10 10	6 6		
20.4.10		٠		ē				9.248	1,387	100	r	10 636									312,071
26.4	Unitry Staff Cost Subtotal Pend 2c Pendo-Dependent Costs	е е	693		. 2	n s	. 3	9	it s	19 344	k) e	19 344	. 8	i i	, a)			с к	16.355	30	515 625
200	TOTAL PERIOD 26 COST	,	663	5-	Çį.	,	35	67.675	(S)	51 131	, 4	51 131	ï	,	(0) (0)				16.356	25	616 626
PERIOD	PERIOD 2d - Decontamination Following Wet Fuel Storage																				
Period 2	Peliod 24 Girect Decommissioning Activities 34.1.1 Remove sperit tuel racks	316	13	123	88	٠	4.5	,	000	1,322	. 322		,	,	2.450	à	,	,	219 904	50.00	
Dispersal 24 + 2 + 26 + 2	Disposat of Plant Systems 28.1.2.1 Spenti Fuel Cooling 26.1.2. Totals	273	88	U C.	4.4	EE	美麗		307	35 35 35 35 35 35	1,358	9 a	1.3	566	1398	1.5	<b>3</b> 2		195,087	6 6 50 99 60 99	
Decontain 28 1.3 1	Decontamination of Site Buildings 20 1.3 1 Ford Building 20 1.3 Totals	88	E 22	WP les	en en	38	22.2	10.10	9 9 - 9	11	12.	at lat	жж	2.0	RR	* *	έt	36: E	53.074	10-113	7.0
241.4	Scaffolding in support of decommissioning	٠	112	N	a	5	-		31	160	160	٠	ć	108		ř	ı		9.4	107 101 101	i
24 t	Subtotal Penod 2d Activity Costs	195	637	191	118	767	80 90 1		820	3,552	3.552		ř	≥ 923	4 092	r		r	477 443	24.498	ī
¥	P= ★ 권 Admonal Costs 전요 2.1 License Terminaton Survey Management Frogram 2d 2 Sutrotal Period 24 Adminial Costs	4. 4	,0.00	+ 17	t t			10 (b) 10 (b)	185	80 108	801			* *			1. 1			eş e	6.240

Table C-2
Oconee Nuclear Station - Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

		- Van Waar I				Off-Site	LLRW			V.Con-	NRC	Spent Fuel	Site	Processed			olumes.		Burial /		Utility an
Activity	Activity Description	Cost	Removal Cost	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	Other	Total Contingency	Total Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Graft Manhours	Contracto
Danied to	Collateral Costs																				
2d.3.1	Process liquid waste	9.9	2.	70	210	-	420		193	991	991		12	-	1 179		72	ria:	96 873	230	
2d 3.2	Small tool allowance		23				1		3	27	27		-			-	14	- 2	1000	210	-
2d:3:3	Decommissioning Equipment Disposition		-	109	29	626	2		124	940	940			6 500	373	-	- 2	-	303 507	88	
2d 3 4	Spent Fuel Capital and Transfer	-		17060				747	22	169		169	-	-		-	-	-	1,000,000	-	4
2d 3.5	Survey and Release of Scrap Metal	-	-		-			94		108	108		-	- 2	.4		-	-		18	
2d 3	Subtotal Period 2d Collateral Costs	98	23	179	240	605	493	241	357	2,236	2 067	169	171	6.000	1 552		Œ	1.5	400 380	318	
Period 2d	Period-Dependent Costs																				
30.41	Decon supplies	62		1-1	-			14	15:	77	.77.		100			0.00	0.5	3.5		1-1	-
24.4.2	Insurance		-	(*)	1-1		1.0	169	17	186	186		-		15	0.50					*
2d 4.3	Property taxes	-	-	)=i	-	(=)	-	3	-0	4	4						18			10-0	-
2d.4.4	Health physics supplies	20	305	-		(-1			7E	381	381			1-1	3-0		3-6	1.0		:*:	-
2d 4 5	Héavy equipment rental	-	1.155	-		(4)	5		173	1.328	1.328			-	-		(8)	-		IN.	
24.4.6	Disposal of DAW generated		-	14	12	-	36		12	74	74		120	:=:	845		180	100	16 906	11	-
2d.4.7	Plant energy budget		-	-	121	-	-	280	42	322	322		1.0			(-)		100			1-1
2d 4.8	NRC Fees	-	12	160	121			238	24	262	262	-	-	12	-	-	-		-	100	14
2d.4.9	Emergency Planning Fees	-	12	-	121	-	5	149	15	163		163	100	121		1967		100	×	140	121
20.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-		-		198	30	228	228			1.2	72	721		-	2	12	20
	Indirect Overhead	-	-	-		-		604	91	694	695		34	-	13	727	-	-	2	823	
	Security Staff Cost	-	-		-	2		88	13	98	98			-		-	-	- 6		-	3,30
	Utility Staff Cost	-	-	-	-			5.601	840	6.441	6.441	200		-	-	-		-			100 91
2d.4	Subtotal Penbd 2d Penod-Dependent Costs	62	1.450	14	12	151	36	7.329	1 348	10,261	10.097	163		4.50	845	:5	*		16.906	31	104.22
20.0	TOTAL PERIOD 20 COST	955	2.121	350	369	572	1 287	8 186	2 110	10.849	16.517	332	*	6,923	6,479		ă.	181	894 729	24,847	110.466
PERIOD 2	e - License Termination																				
Period 2s	Direct Decommissioning Activities																				
	ORISE confirmatory survey	0.0		-90		193	100	150	45	195	195				400	100					-
2e 1.2	Terminate license					-	-	100			124										
20.1	Subtotal Period 2e Activity Costs					-	2.0	150	45	195	195		120		-		0.00		-	0.00	141
Petrod Te	Additional Costs																				
	License Termination Survey		19		-			5.264	1.579	6.844	6.844				10	12				131 203	3.12
2e.2	Subtotal Périod 2e Additional Costa	- 3	-	-				5.264	1 579	5 844	6 844			-	12	120	760			131 203	3 12
Penod 2e	Collateral Costs																				
2e.3.1	Spent Fuel Capital and Transfer			-	-			37	- 6	43	- 2	43				-			2	-	-
2e.3	Subtotal Period 2e Collateral Costs				-			37	- 5	43		43	171			-	.5	-	5		-
Penod 2e	Period-Dependent Costs																				
2e:4.1	Insurance	-	15	-	-			217	22	239	239		100		15					(5)	
2e.4.2	Property taxes	-	1.5	-				. 5		5	5		16.					-	-	151	12%
2e.4.3	Health physics supplies	-	816	-	180	180			204	1,020	1.020									-	
2e.4.4	Disposal of DAW generated	-	100	5	4	363	13		5	28	28		1.5	-	315	2.00		170	6.299	11	7
2e.4.5	Plant energy budget	-	100		-		-	199	30	229	229						10.00				2
	NRC Fees	-	-	181	-			355	35	390	390		-		•	:-0	16	0.00	-	2.5	-
2e 4.7	Emergency Planning Fees			380	1.0			25	3	28	1	28		•		:=					-
Ze.4.8	Indirect Overhead	-	-	140	(-)	(*)		414	62	476	476		-	-						-	
2e 4.9	Security Staff Cost		-	-	-	-		122	18	140	140		-	-			1.0	(8)			4.71
	Unity Staff Cost			~	_	-	14	4.060	609	4,669	4,669		-						- 1	-	69 14
2e 4	Subtotal Period 2e Period-Dependent Costs	-	816	- 5	4	-	13	5.397	988	7.224	7 197	28	-	*	315			-	4.299	11	73.85
2± 0	TOTAL PERIOD 26 COST		616	5	4		.3	10.848	2.618	14,305	14 235	70		-	315	-	12	-	5.299	131 215	76.97

Table C-2
Oconce Nuclear Station - Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

	_					Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	olumes		Burial /		Utility and
Activity	Activity Description	Decon	Removal	Packaging Costs	Transport Costs	Processing Costs	Disposal	Other	Total Contingency	Total	Lic. Term. Costs	Management Costs	Restoration	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		Contracto
	- Site Restoration																				
Penad 3b (	Direct Decommissioning Activities																				
Daniel of those	of Remaining Site Buildings																				
	Reactor Building		4 114						617	4.731			4.731							53 465	
	Aunhary Building		826						124	950			950		-					12.013	
	Turpine Building		7.526					-	229	1.755			1.765	340		-			543	27.589	
	Turbine Pedestal		407		-				61	466			468	-	140					4.881	
	Fuel Building		546		la la				97	745			745		(4)	-		2	147	9 163	
36 1 1			7.520			-			1.126	8.649			8.649		140			-	-	107 510	
	out Activities																				
	Grade & landscape site		85	-	-	2			13	99	*	-	9.9	120	140			8		191	
	Final report to NRC		2.5			-	*	45		52	52	*	12.516					3		1000	56
3b.1	Subtotal Period 3b Activity Costs	•	7.60E			•	-	1¢	1 148	8 799	52		8.747				-		•	107 702	56
	Additional Costs		-										12.40								
	Concrete Crushing		267		-			3	40	309			309				-			1.359	
30.7	Subtotal Period 3b Additional Costs		267			-		2	40	309			309		-		-	-		1 359	
	Collateral Costs									-											
	Small tool allowance		.8	-	-				12	89		-	86	-		-					-
	Spent Fuel Capital and Transfer					-		199		183		183	-	-		-			-		
26.3	Subtotal Period 3b Collateral Costs		78			•	-	159	36	273		183	8ċ		-	-	-	-	-	-	-
Period 3b F	seriod-Dependent Costs																				
3b.4.1	Insurance				340	74	-	668	67	735	0	661	7.3	5-6	100	947	100				
3b.4.2	Property taxes	-	-	-				15		17		-	17			(-)			90		
3b.4.3	Heavy equipment rental		5.792	167	-	-			1 019	7,811			7.811			-	-			-	-
	Plant energy budget				-	97		307	46	353		318	35	-		-					
	Emergency Planning Fees		*		-	-				85	5	85				-		-			
	Indirect Overhead		-	•	*	-		739		850	650				(2)	-					
	Security Staff Cost		-		-	-	-	160		184	0	129	55		12						5 05
	Utdity Staff Cost		(il record	-	-		-	5.888	1.033	7,921	0	7 129	792			-				*	123.42
3h.4	Subtotal Period 3b Period-Dependent Costs	-	6 792	•			-	8 854	2 309	17 955	650	8 322	8 783	•					•		129-47
30.0	TOTAL PERIOD 36 COST		14 743			(7)	-	0.060	3 532	27 336	902	8 505	17 929			-		-		109 061	130 13
PERIOD 3	d - GTCC shipping																				
Penod 3d I	Direct Decommissioning Activities																				
Nuclear St	earn Supply System Removal																				
	Vessel & Internals GTCC Disposal	140	-		(4)	(*)	9.749	-	1.463	11,212	11,212			5 m				440	79,646	-	
	Totals		-		-		9.749		1.462	11.212	11.212			18		-		440			
	Subtotal Period 3d Activity Costs	-					9:749	-	1,462		11.212			1.0		-		440			-
3d 0	TOTAL PERIOD 3d COST	**		140		(4)	9:749	-	1.462	11,212	11.212	-		-	(4.		1.0	440	79.646		
PERIOD 3	TOTALS	7	14.743		120	*	9.749	9.060	4 995	38,548	12.113	8,505	17.929	12	12	-		440	79,646	109,061	130.13
and the second	ST TO DECOMMISSION	8 787	60 001	10 494	5 710	17 479	68 302	218 554	77 737	ACT DIE	377 426	57.591	22.027	185 584	137 730	3.887	517	440	18,661 P20	887 500	2 830 3

## Table C-2 Oconee Nuclear Station - Unit 2 DECON Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial '	/olumes		Burial /		Utility and
Activity									Total												
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours

TOTAL COST TO DECOMMISSION WITH 19.96% CONTINGENCY:	\$467,045	thousands of 2008 dollars
TOTAL NRC LICENSE TERMINATION COST IS 80.8% OR:	\$377,426	thousands of 2008 dollars
SPENT FUEL MANAGEMENT COST IS 14.5% OR:	\$67.591	thousands of 2008 dollars
NON-NUCLEAR DEMOLITION COST IS 4.7% OR:	\$22,027	thousands of 2008 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC)	142,133	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	440	cubic feet
TOTAL SCRAP METAL REMOVED	43,942	tons
TOTAL CRAFT LABOR REQUIREMENTS:	887,500	man-hours

End Notes

N2 - Indicates that this activity not charged as decommissioning expense

- indicates that this activity performed by decommissioning staff.

0 - indicates that this value is less than 0.5 but is non-zero,
in cell containing " - " indicates a zero value.

Table C-3
Oconee Nuclear Station - Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed			olumes .		Buffal #		Utihty/and
Activity Index	Aciiviiy OO'Ct/Pilon	bocon COSI	AemUII.II Co.s.;	Packaging Costs	Poutsport Costs	PrUC8utinQ Costr.	Disposal Couts		Totill CommedialCy	TOIOI CotiS	Let. TOUN, CORRES	Mttnogon/f/nt Costs	Restort)lion Costs	Votume Cu rb	CII3u A Cu, Feet	Clou B Cu, Fe.	Clian C Cu. F#e;	Glee cu. Feet	WI., LOS.	c,::art Manr.ou,:	Contrac!OJ MalibiOutS
PERIOD	a - Sh1.HdOwn ttuou9h THinaUlon																				
	Direct Decommissioning Activities																				
a.1.1	Prepare preliminary decommissioning cost		-	-	-	5.5		3.6	5	1.1	43			1-1				-	160	-	556
911.2	Notification of Cessation of Operations									1											
18.1.3	Remove fuel & source material									1/4											
10.1.4	Notification of Permanent Defueling									3											
18 15	Deactivate plant systems & process waste							616		a	4.14										2.50
b1&	Prepare and submit PSDAR		•		-	-	-	5.0	.9	67	67	•	•	•		-	-	-			:)5&
'oj 1"	Review plant dwgs & specs	-	-		-			133	50	153	153	-	-			-	-	*		-	1.969
14 1 0	Perform defailed rad survey								4	33	),										
1J 19	Estimate by-product eventory End product description			12.			-	7.7	*	33	Ü		151		),=.:	(*)	-	**		,	425 428
y≜ 1.11	Detailed by-product inventors	•			-	-		29	į.	4J	43		(*)		-	*	-		(*)		556
	Define mass work sequence	-		1.0	-			217	ic	260	350		(=)				-				3,218
10 1 12	Perform SER and EA				-		-	56C	11	ıeJ	10.3		-			1.0	-		-		1321
	Perform Site-Specific Cost Study		1		-	-	-	1,F,	22	1.65	166		-	-	1.5	-	-		-		9.140
	Prepare/authmit License Termination Plan				-		-	119	18	On,	136			-	-	-	-		1-		; 'S1
	Receive NRC approval of termination plan			-		-		115	10	A	130										, 131
Activity 5	pecifications																				
	Plant & temporary facilities				-		-	112	23	1:78	137		16.	140	140					.1	2 106
	Pian' flJ,lemS		-	(+)	12.7	-	-	121	18	1:19	125	-	14	-	-	-	-		150	-	1.787
	NSSS Decontamination Flush		* 1	9	-	(27)		t.,	2	11	17				-	•		*		*	3'+1
	Retlet(cp internals					9		206	31	735	21t	9					-		1.0	-	] DJ.,
	Relation vessel				-		-	188	28	21e	2 10			-		200	-	11.			2.782
	erotOO't.al "!"-ekt							111	2	11	, <b>, r</b>	*			-	+					:n-l
	Steam generators			-				50	1.4	104	104	8									1.335
	Re'filoli;ltd ::>n(",,,			(*)			•	46	-7	5]	27	-	27				-		-		685
	'i'diri TuirDine		-	470	1.20	-		12	2	11		-	11		-				1.5		177
	I itim Concinmisers				1.0	17.0	-	12	2	11	*		13					-			171
	PLitti structijiti 6 buildings	-		1.0	(*)			G⊲1	16	0.4	52	-	****								1.335
	Waste mullilyiment			170		-	17.0	193	2.0	153	153	-	-	-		:=:					1 969
	Eacting Mile (Liste\JIII)				(*)	-		ti:	4	.ic	75	-	15	-		340	-			-	le!
ta 1 17	Total .	(*)	-				-	1.095	164	1.259	11109	•	150			-		1-1			15 190
	Site Preparations Prepare dismanting sequence							69	10	80	90										1 UZ:
18.1.19	Plant prep & temp syces			-	-	-	-	2.700	495	1 '0	3.105		(-)		-		-				1 02.
ъ1:0	Design water clean-up system				-		-	41	-,	0	47					-				-	599
ta ; il	Rigging/Cont. Entri Envips/taoling/etc.							2 100	J15	2415	2.415				-	-	-			-	-
	Procure casks/imers & contamers							36	510	4	,,			- 2							526
111	Subtotal Period 1a Activity Costs			-				6.935	1.840	7.405	11:15		150				-	-			31 586
	Additional Costs																				
1821	Ashestos Remediation		2 759	*	283		2.164		17)	li anj	6.481			-	26.455				210,915	35 451	
12.2	Subtotal Period 1a Additional Costs		2759	1	283		oi"64		; 11'J	fi 481	6.481	*	-	-	25.455			-	J30.915	35.451	
	Collateral Costs		140							je.	10										
1832	Small tool allowance		42	-				704	e	846	18	- 14							-		
	Spent Fuel Capital and Transfer		AP.	•				735	qr		Je	54£ 84.0									-
1a.3	Subtotal Pened 1a Collateral Costs		9.0	•			1.5	*35	ч	81111	30	84.0			-						
Ptologica (J. 101.31)	Period-Dependent Costs Institute							735	77	852	162							_	-		
	Property laxes							2 001	301	2 210	2-; 10	-		-							
	Control of State of S				-		-	2 001	407	==10	, IU		0.5	-	45		-				

Table C-3
Oconee Nuclear Station - Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burnal V	Volumes		Burial /		Utility and
Activity Index		Decon	Removal Cost	Packaging Costs	Transport Costs	Processing Costs		Other	Total Contingency	Total Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu, Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contractor
Period 1s	Period-Dependent Costs (continued)																				
1a 4.3	Health physics supplies		586	-				-	147	733	733				60		-			-	
1a,4,4	Heavy equipment rental		458	-	0=0	0-			69	526	526			-	-	-		-			: •
1a 4 5	Disposal of DAW generated	-	-	-	8	7=	24	-	8	50	50		-	-	571	-		-	11,419	21	100
18.4.6	Plant energy budget	(*)	~:	*	-	-		1.324	199	1,522	1.522	-	-	~	-	-	-	-	-		-
1a 4 7	NRC Fees			-	-	-		471	47	518	518			-	-	-	-	-	-	-	
1a:4.8	Emergency Planning Fees	-	-	-	-	-		261	28	309	145	309		-	-		-	-		-	
1a.4.9 1a.4.10	FEMA Fees Spent Fuel Pool O&M	-	-	-	-	-		126	112	857	142	857		-	-	-	-	-	-		
12.4.11	ISFSI Operating Costs	-		-	12	_		109	16	125		125						-	-	į.	-
18 4 12	Indirect Overhead			-				2 135	320	2 455	2 455	-				9		9			-
18.4.13	Security Staff Cost	-	- 2		-	(¥	-	4 555	685	5.251	5.251		-		-			2			157,471
						-	-	19.235	2,886	22.125	22 125		_	2		2	2	- 2			356 657
1a.4	Subtotal Period 1a Period-Dependent Costs		. 04-	10	9		24	35.780	4 814	37.680	36.388	1.292	=	-	571	ä		-	11.419	21	514.129
1a.0	TOTAL PERIOD 1a COST	-	3 845	1*	291		2 188	39.451	7,244	63.029	50,742	2.137	150		26.026			¥	342 334	35.472	545 695
PERIOD	1b - Decommissioning Preparations																				
Period 1t	Direct Decommissioning Activities																				
Detadeo	Work Procedures																				
16.111	Plant systems	140		-		1-	-	137	21	158	142	-	16	-	-	-	-	18.	-	-	3 026
10.1.1.2	NSSS Decontamination Flush	2.00		-	*		0-0	29	-4	33	33				*	-	-	4			428
16.1.1.3	Reactor internals	190	9				520	72	71	83	83	-	-	-	-		×	-			1 070
1b.1.1.4	Remaining buildings	-		*	2	14	~	39	6	45	11	100	34	-	-	¥	v	-		-	578
	CRD cooling assembly			*		(2)	195	29	4	33	3.3	127	-		-	-	¥		-	-	428
	CRD nousings & ICI tubes	*	*		-		191	29	4	33	33	120		-	9	¥	-	-			428
	focore instrumentation			-	-	•		29	4	33	33	-	•	-	-		Ü	-	-		428
	Reactor vessel				0.50		-	105	16	121	121	*	*	-	7	8	8	*			1 554
	Facility closeout		-		7.	0.51	(8)	35	0	40	20	-	20		×			-		•	514
	Missile shields	15		-	7.5	15.	186	13 35	2	40	15. 40						-	-	-	-	514
	Steam generators			-		-	1.0	133	20	153	153	-	- 1	-	-	5	-		-		1 969
	Reinforced concrete	-	-		-	-		29	4	33	17		17	-	-		- 1				428
	Main Turbine				-	1.5		45	7	52			52				_	2	-		668
	Main Congensers	-	-	-	(*)	-	-	45	7	52	9.7	-	52	12		-	-		-		668
	Auxiliary building	181	-		1=		-	79	12:	91	82	-	9	-				-			1.158
	Reactor building	120	-	2	191	141	141	79	12	91	82		9	1.00	-		-	-	-	-	1 168
16.1.1	Total	-	-	-				962	144	1 107	898	-	208	7		-	-			-	14.228
7b 1.2	Decon primary loop	515		-	12	12	121	1-	258	772	773	-						2	-	1 667	-
10.7	Subtotal Period To Activity Costs	515	-	9	-			862	402	1 880	1,671	-	208	*		÷	-	-	40	1.067	14 228
Period 10	Additional Costs																				
10.2.1	Spent Fuel Pool Isolation	16	8	-	351			6.272	941	7,212	7 212		×		9			2	21		
16.2.2	Site Characterization Survey	150			96			1.252	376	1,628	1,628		8		- 3		*	8	-	8 167	3.357
10.2	Subtotal Period 1b Additional Costs				-	-		7 524	1.316	8,840	8 840		-	-				5	-	8 167	3.357
	Collateral Costs																				
1b.3.1	Decon equipment	883		-			-		132	1.016	1,016		-				-			2.00	
1b.3.2	Process liquid waste	29		56	171	-	2.373	(*)	639	3.268	3,268	-	-		188	762	•	*	95 826	185	10
16.3.3	Small tool allowance	-		-	-		-		0	1	1	-	-	-		-	-				
th.3.4	Pipe cutting equipment	-	1.000				-		150	1 150	1.150		-	-		-	-	=	(=0)	-	
16.3.5	Deconing	1 400	-	-	-	-	:-:	450	210	1,610	1,610		•	-		-	-	-	-	-	
tb.3.6	Spent Fuel Capital and Transfer	-		-	-		-	152	23	174		174	-	-	-	-	-	-		-	141

Tablic C-3
Ok/Olife Nuclear Station - Unit 3
UECON Decommissioning Cust Estimate
(thuu§nnd§ of 2008 dollars)

		Gime	. 5.50	ANTA NAME OF STREET	200000000000000000000000000000000000000	Off-Site	LLNW			10.75.70	NRC	Spent Fuel	Site	ProCallued			/olumes		BUIIOII		Unlity
Activity	Activity Description	Cost	Removal	Pac:kOlg,nu	Transport Costs	Processing COS-1a	Co.!!	Othe	COMBRIGHT CO	IQIIII C:05ts	LJefhlfil Cosh	Management Costs	Restonduon Costs	Volume Cu Feel	ClassA Cu. Feet	Cu Feel	ClasssC Cu Feil'l	GTee Cu. Foet	Processed WLLbs.	Craft Manhours	Contra Manho
						00311	2.174						00313	Curren			current	Cu. 1 oct			
3 3	Subtotal Period 1b Collateral Costs	2312	1 0:01	56	771		5.378	152	1 155	7.120	70946	174	-	~	lee	"G":		-	=5 1.25	185	
	P.er,od-Dee-ti.,,d.";: Gcdb																				
b.4.1	Decon supplies	31			140	140	-		. 7	BH	1-2	2	12	-	-	12	624	(5)		-	
ti 4 2	Itiserance	-	-	7-2	-	-	-	1111	J'j	CJ:	4112	¥	191	2			120	121		•	
04,J	Pt00E1) taxes	120	2.00		-	-	7.	51	S	5fi	.24	÷	12	2	-		121	120		•	
ot. 4	Health trhysics Mtplije's		240	-	100			-	60	10<	Joe	5	*				=				
o.itli	Heavy equipment rental		232			-	1		05	261	261 2q		1.0			-	-	(5)	12000	1	
!÷ g	Disposal serOAlikigeralcited Plant energy budget		-	0	2	1.0		- 1ol.:		1.543	.S<6J	-		-	32121		(5)	150	6 55 1	12	
oit	*NRS Feitt			()	2.5	(*)	-	239	1101 24	261	20502		100	5	-	5.71	-	7	-	-	
4.9	materighted Planning Feet	-	-		1.5	(7.)	-	142		15.	250.0	iSi	1.5			-	1.51	-	-	-	
	FEMA Fees	-			(*)		(5/2	94	10	.5.	7.1		-	=	-	-	-	-	5.53		
4 10	SDerri -L. jroood O. M	(2)	-	1.5	(*)		-	3:e		35	12	435		-	1-	2.52	(*)	-			
4.12	ISF'Sf Operating Costs		-	3.51	-	-		58	Dr.	100	4.1	64			-	-	-			-	
1.2.13	Indirect Overhead		-	3,5	-			t 323	198	152;	1521	D-4	-	-	-	-	-	-		-	
4 54	SloCwir.; 511"'C:0"		-				-	7,3,1	347	2 662	2 £84;		-	-	-	-		-			7
1.4 t5	Utility Sruit Cost			-			-	10.070	1.873	13.995	13 995		-	-	-	-	-	-	•		22
4	Subtotal PGO'IX: to Ftf-r1tiO-OtperdefJ C «!J,	37	472		- 5		14	"'-4:Q	::IY	21 11:5	2'41':';	555		-	3)1:1	-	-	-	6.551		
		4.					14			21 112.0	27414	900			3)1.1		-	-	0.001	12	- 25
0	TOTAL PERICU te-COST	2 8=4	1.473	€2	176	1-0	5.315	27. <b>1J</b> .	Ş ₹£M	39 769	3-1 TJ:2	829	DOU		916	10	12	121	1.3! 1:"6	8.431	á
RIOD	TOTALS	J 451	9316	72	M;;=	120	4:57.5	66,558	12.952	s:! -eEl	e&;,:rJ	?'96f	359		93 >=?	iC2	8	-	444 711	44 903	6
ERIOD :	a • Large Componeont Remo\al																				
enod <b>2</b> 8	Direct OepartnwM, (jfing Activities																				
	team Studolj System Removal		600								ш										
	Reactor Cdt/\\text{\text{Y1}} PHo-I'Q	156	153	16	30		250	•	186	798	798 104	17.1	-		<-11	-	150	-	!,o.:,ng	• 0'13	
	Prksutuzer Filliell ank	18	£,	1	- 17	Sec.	45	(2)	23	't}.1					;ef			-	2OJ:,J'}	612	
	Reactor Coolant PurreM. Malor;	11.1		4)	Z"	123			='9	3,580	≥£8:0			-19!!	8 997	-	199	-	Pl24 389	4 508	
	P:'(%,ti,l)Iner	J.	45	1:24	200		1,177		355	1.935	1 !135		-	-	18::S-	25	100	-	107.604	;")61	
.18	Steam Generators	1.1	1 fo)7	t 154			11.288		3 5'1'	119 781	16 PH1	-	15		12 865		1-		• s'one	11 E15	
1116	Rtitillij Steam Generator Unigs	1	21	1::85			11.288	(4)	3.004	15 -J:"	15 ?- <b>U</b> li	-	=	-	12.866	-			1810.770	5, 00	
.;1'"	CHDMa"CJ.,seo•ee Structure Mil'11;;]V:l!	H.:		‡≼t			1car		183	,55	859		-	-	3 5 1 6	\ I	-	-	77 Too.	4.478	
1115	Reactor Vessel JITO: Inals	e,	216"	01 528	Dis		a Sse.	210		223 288	21 283			-	,2'0	122			247 1(±0	26 133	
	Reactor Vessel	5J -Je	4231	3.000			inll	:/D	31.40.5	24.314	24 314	-	-	498	li&6:	3 1:5	-	-	¥ť CJv	:6 '3J	
1.1	Totals	-16	8 560	8.365	3.719	123	44 792	420	23 757	89 494	39;454	-		498	48 :J,;	3 1.3	517	•	f C12 02"::	8:5: 253	
	of Major Equipment		200	***	79	-	20.0		1.7×	5.000	T. 704.11			7.000	of a new				515100	- 0.54	
e t2 ⊪1J	Main Turbine/Generator	•	308	269					373	E.086	: >!!!!oi		-	3.819	2.127		120	-	5'542;;	6:11	
13	Main Condensers		9.15	"J	1924	5"0?	11'	-	398	2.283	3:280	-	-	5 044	1.487		-	4	1E0 419	2.11:53	
	Costs IrAn elektel Building Demoktion		-						Ton		1200									2000	
	Reactor Building		9.90		12	121			1Ve:	il ha	816	- 101				*				i <j j<="" td=""><td></td></j>	
	fr,IY/"A") E;Uki'rg	-	125		0.20	0.00	100		19	141	103	- 20		*	*	*	1-	-	*	11!!!8	
	HIH Machine StooP li:C/T.PIQ4		7	*		-		8	1		- 1	9	8	*	-	4	15	-		102	
144	It'r"Illr:ROnllrff.JtallTog ':J"""C';	-	22	-	1.0				$I_{1}$	26	্র :19	•	8		-		-	100	•	441	
	Rod waste F≡kbilli, C;rill1-(Irill		207						3,	239		-	5	5	*		-	(2)		2.577	
	6or nin Bonding (QfTll'nl);fl		11						E		14						3.50	100		2,75	
1 15									714	tEl.?	167									- 15	
a S 15 .a' .••	"utl'J"t" Bkt,o;		:(J	2	AT.	100		-			0.7	-			7		3.50		-	. 95	
a'	"uti'J"t" Bkt.jo; f' pkaft.p t",tab,		(J N-		7.5 7.5				:lw	'IE	1\$,			-			3.5			:")5 le	

Table C-3
Oconee Nuclear Statiom - Unit 3
NECON Decommissioning Cost Estimate
(thutuskinds of 2008 dollars)

A 1911 101		T. D. C.	- Account	4000		Off-Site	LLRW		-	-	NRC	Spent Fuel	Site	Procili'\$sed		Burnan			Butial /		Utility and
Activity	Activity Do Capuon	Decon	Cosi	Potek:19lf19 Costs	Iranipoti Costs	Procenting Costs	Q.spoaal Conts	Costs	Tol.111 Contingency	Total Cosits	Lie, Term, Costs	M:1n3gement Costs	ReStout-sitiOfi Costs	Volume Cu. FEEt	ClauA Cu Feet	ClauB	Claus C Cu. Feet	GleC	Procuolud Wt., Loni.	Craft	Contractor
mack	Activity Despitabation	6.00	COSI	COSTS	GGPtS	Costs	COILLE	00313	Conningency	COBIG	Costs	Costs	Cusis	Cu. Feet	Cu, reet	C.U. Peet	Cu. Feet	Curren	Wt., Lua.	mannout 5	mannours
	of Piant Systems																				
	Auxiliary filetim catured)		;'7IJ		121	2	-	19.5	40	910	-	•	310		-					8<:1.j	
	Auxiliary Steam li-(larea) FU;,6		10	3	3	iln		2.0	4h	263	26j	-		1242					50 422	≥ 371	
2.L 153	CMtlCin [h; L=Ufi , th:aft53]	1.0	10		-		100	*	2	- 5	-	-	5							1:310	
2a.15.4	Cal'tiO' C.Q.oeo (shano) R.C.A. Chemical Addition		1.00	U	0	- 2			5	041	29	-		191		-	-	-	5337	270	-
	Crten'Ktoll Actuikht RCA	1.00	27	- 0		- 20			4	S	52	-	žt	222			-	-	00110	871	-
	Chilled Water (anilrN.		134	U				-	20	154	. 54		38.4	222					901G	501 011:75	
	CotIdel's'ute		52.	-					79	6e'lU		-			-		-			15 699	
	Condensate (Contaminated)		1/0	29	-11,	779,4	-		586	a :151:	40>"	-	5°H	., IOJ	-		-	-	1 2 H 881	154,71	
	Condenser Circulating Water		338	- 27	,	1 .590	-		f	38"	4000	-	)80	.,, .99		-	-		1.033,001	10 040	
	Demineralized Water (snared)		134		-				29	154			154							4.267	
	Demineralized Water (shared) RCA		78	1	3	7.2			10	185	:30		1241	808					n 615	1 782	
	Diesel Air (shared)		43						- 6	J.	,		49			100	- 2		02.010	1 367	
	Diesel Jacket Water (shared)		7						0	d		0	4	- 0						96	
	Diesel Lube Oil (shared)		11						2	18	2		13							346	
	Electro Hydraulic Turbine Control		16			-	-		3	20			20							490	
28.15.17	Equipment Cooling (shared)		69						13	102			1C2	-						€ 728	
20 15 18	Essential Sighori Vacuum (shared)		85	-			-		13	9"			97		1-	-	-			2 549	-
2a.1.5.18	Feedwater & Emergency Feedwater		'63		-	-	-:		2J	187			11)7		-					. 8i:1	
2a 1 5 20	Feedwater & Emergency Feedwater (Cont.)		172	6	31	641	-		112	r4a	'ol-l	-	-	1 873	-				197 905	J Ja7	
28.1.5.21	Feedwater & Emergency Feedwater RCA	1	227	G	11	41	- 1	- 0	12;	820	01-		-	4 8115	-	-	-	1.00	195 \$60	5531	-
	Filtered Water (shared)		.&.						15.	113	*		113			1	-	141		2.925	
	Filtered Water (shared) RCA		12	1	2	59			32	Hi!)	,9<		-	91'5	-	-		120	3!f 59r1	165?	
	Heater Drains	14.1	1< ':;;	51	,7	1!11	10.7		953	."jA']	F JAL		-	41405	3.4	1-	-	1	1011 "loti!	j# httd	-
	He.at, Ctilnt. iC-ml.a"IIII'l, Hej		11	-	-	-	-	-	12	91	-	Ξ.	&J				140	-		2 239	
	"H&loilOl Jt'11		31	~	(2)				fi -	<b>X</b> 3		=	:;e		-				-	; 00.2	-
	High Pressure Extraction		94	-					Ji.		-		27	-		-		-		129	-
	f-gn PrelLsu-B StHVitth Waler rin4lleill		1(1	-	.*		-		15	1,000			116	*	-		-			)0115	
	H,(h):liellcOrl		2	-	-		-		,	J		-	3					18	-	75	-
	HyQfOOt ri-	-	21	-	-	-			14	3:P.			MC.	•	-	-				p,"	-
	Hjur(JQel' Seal Orl		20		-	•			•	99		*	22	-		1.0	1.0				
	Keowe, Decompressing All ,shalifd		200	-	180	7.5	-		1	- 3 - 40	-		E			1.5			-	153	
	Ly(INP;t/UUf'e hUJiKt;u" LOwPritss.itr Service Will'er !//hut'HI		- IIIi 3¢3	-	-	7.5	-		Za.	148			148		0.00					" O\(;j	-
	Main Steam		M		100	·*			13	87		*	148	-	100					9,404 2,558	-
	M.all'I Steam RCA		11.5	37	65	£ 535			4t9	01136	3 403		3-6	2' SCB		-			1.129.2B-4	111693	-
	NUtroyen (shared)	-	1.		63	1. 555	-	•	413	0H≫6 54	1.409	•	54	2 5GB	-		-	-	1.129.2B-4	• SIII	-
	t Jilfogen unareo RCA		66	- 1		45	-		2J	140	140			5.14	-	-	-		21 704	• 44.7	-
	Periodic 1nh/9 (shared)		34			-7		- 0	,	V6	1-0		16			-	-		21.104	41'3	
	Pfant Heating StUEFI InhaneCl.		213						32	245			2,5							ETT	
	P.toJ. Accident Monitoring		29	,	1	3/7			n)	110	10			401		-		-	16,304	i"B:	
	Reactor Bwkling Stfliv	-	1-9	3	5	191			52	D9	339			2168	-	-			85,488	2 150	
	Recirc Cooling Water		16!			-			22	:1tl9			:10_							\$!>4r	
	Rrctrt Coot.ng W≼llef RC.f.		122	2		157	-		55	341	3.41	2	-	1 72:					76 146	2ee?	
2J, 15.45	Sample liOfIltofmg		;I>		13	22	85		ii ii	298	237			:34:4	436				491VIO	j'Qol	- 2
2 15 -Nt	S.K;;na S,ao Co:J T"""er,1 Pc,n:J ,IJ"1'fl11	1.0	37	-	-	-			S	13	-	-	43			-		-		l'Ile	
	Servin ILr ith:wedi		Yi	-	-				8	45			JS	-						f 1\$4	-
	Srandby Shuttlonn Facility !Id41eJ,		27	-	-	-		*	4	31			31							841	-
	Stator Coolant		103	- 8	-		*	3	7=	5-5			33	-		2.5			-	1.507	
	Sth'am 001/10		51	-	5.	-	-	-	12	98		-	13		-	1.0		12.		2 668	-
	Steam Seal		Al-	1	1	43			19	1'9	118			533			160		Z1 649	т (;е,	
	l'urt;,ne' 011	-	11.	-		-			1B	119		-	1.H9					196		,H118	
a 1 5 5;		-	114		1				17	lj,1	200		;11			(4)	-		L. March	J 0138	
2a 1 5	Tuot ii h		= 131	160	189	fi.!-5 <del>5-</del> 1	8#		2! 4.11	21 540	17, 408	-	JPT.	11H 11)	Jie			1.0	4 119 780	188 Ci≥l	
2s. 1 G	Scaffolding in support of decommissioning		-i,	ta	3	.94	9		199	OJJ	1 OJ.;	_		,,(t	10				35 948	12 5.81)	

Table C-3
OCOMET Nuclear Station - Unit:3
DECOM Decommissioning Cost Estimate (thatastands of 1/10% dollars)

						Off-Site	LLRW				TRC	Spent Fu.cl	Site	Processed		3\1u,1 V	QII,ImQ.		Burial /		Utility a
Activity		nO <q"< th=""><th>Removal</th><th>P,ttll-Oiging</th><th>I"f;IIn500ft</th><th>Processing</th><th>Ol/5posal</th><th>OUWf</th><th>tol;titl</th><th>TOLH</th><th>Lie. ferm</th><th>Management</th><th>Re:starQittOn</th><th>VOtUni'e</th><th>ClasssA</th><th>Clau B</th><th>CI;OII"C</th><th>Glee</th><th>Picx.gueu</th><th>Craft</th><th>Contract</th></q"<>	Removal	P,ttll-Oiging	I"f;IIn500ft	Processing	Ol/5posal	OUWf	tol;titl	TOLH	Lie. ferm	Management	Re:starQittOn	VOtUni'e	ClasssA	Clau B	CI;OII"C	Glee	Picx.gueu	Craft	Contract
Index	Activity Description	Cost	CO.81	Costti	Costs	Cosl5-	Costs	Cost\$	Con liftjannry	Costs	Co:s.ts	Costs	Costs	CU.RH(	Cu. Pfi!	Cu. FWI	Cli. Feet	Cluffett	Wi- 18"	Manhours	Manhou
1	Subtotal Penod 2a Activity Costs	738	18 985	BH.1	3 143	th 2tc	45 5,71	420	2 .99.4	117 976	113 645		41131	112t 348	<b>52</b> .832	3 125	§17		11,766,680	358 834	412
HIII: 2a	Add TiOnlid Costs																				
	"EL4t Na&fr: C"Spesa!</td <td>-</td> <td>-</td> <td>7</td> <td>2</td> <td>15</td> <td>520</td> <td></td> <td>3</td> <td>27</td> <td>27</td> <td>141</td> <td></td> <td>12G</td> <td>*</td> <td>2</td> <td>12</td> <td></td> <td>7.363</td> <td>92</td> <td></td>	-	-	7	2	15	520		3	27	27	141		12G	*	2	12		7.363	92	
	Subtribili Period 2u AOctroimi ricciji.		w	7	7	15	-	341	3	27	27	140	2	:20	4	-	-	-	3.0	52	
1100 Pa	oll.U£nl' C≡stI																				
	Process liquid waste	71	-	28	86		325	-	S;	3-91	391				481	_		12	2e 8ee	94	
	S"Tiillillooi allo s. Proo	1.71	256	20		9	1,00		11	295	265		29				10		20 000	9	- 6
	Soent Furl ClQ'1.1 and Transfer	9	-		8		100	3.38	21	lb_s	-	388	2.5	- 5		8		2		8	
	Eurnom rm Release at S-""tip ,"tt.t.till							447	111	514	514	344				-	-	-			,
	Subtotal FetiOo:12a CO"tfiral CtJ&1S.	711	256	::e	a5		1.35	11111	238	1 588	\ r"o	3.95	29	-	481	-			203 8:58	34	
	Dad or of Wiles and at 19 and																				
	Perlacticient our Casts Deport supplies	61							19	7,	16					_					
	Ir-:Ull"iIntt:	-						J-53	111	9:3	399	-		-	_					-	
	F-roperTi bracco						-	;ti:\P	105	: 1 d	1e).,	-	ľΕ	-		- 1		- 3			
	Hieal/hpillysics supplies		2"OYJ				_	111111	5 13	2 563	2 503	-			- 9					-	
	Heavy equipment rentital	-	7 489		-	-	-		371	2 863	2 163	100	-			-					
	D s.UcS.ill of OAh 9iiiffiiit;atea		2.400		65		192		i.E	400	, 103 (OJ	-			8:513	-		-	91.282	169	
	Plill mwflly budget				0.5	-	- 02	1 423	215	Hi»:	6205				4.21,7	-	-	-	21.606	173	
	APC Fees	-	-		-			510	5\	561	561	-	-				-	-	-	-	
	E"!'ll'r:Jenl; '; ?liJnlT1ng Face	-	-	•	-	•			3(	[5],	54.1	35(:		-		-	-		-	-	
		-	-	-		-	-	17				970	-	-	-	-	-			-	
	Spent Fuel Fold O&UI	-	-	•	-			е,	127	970	7-W	970		-	-	~	-		-	-	
	t.lqalC PacViJIS.le Processing Edulpment/Services	-			•			212	32	244 142	Mot,	142		-	-	-	-	-	-	-	
	ISFaJ Operating Cisurs	-	-			-	-	1,3			2000	142	-	-	-	-	-	-	-		
	IM <rflet'o"tl"filliq< td=""><td>-</td><td>-</td><td></td><td></td><td>-</td><td>-</td><td>?-·i.o</td><td>440</td><td>1:t3!'1</td><td>3:371</td><td>-</td><td>-</td><td>-</td><td>-</td><td></td><td>-</td><td>-</td><td>-</td><td></td><td></td></rflet'o"tl"filliq<>	-	-			-	-	?-·i.o	440	1:t3!'1	3:371	-	-	-	-		-	-	-		
	Sek:IJ/It.5.5Itaff_EdNd	-	-			-	-	4 432	,">("-;	,C9H	5 096	740		-		-	-	-	-		149
	Utility Siraff Cost	01	n 539	-	65		1107	28 ro"i		32:20= 52:025	32,-097 50 452		1		4 564		-	-			489
	SIJbt.::)lill ?;*!IOO ?# P*;f,;::u-Di]oe*!ICHI*t':;;s:/'.	0		,			186	olJl2i!	E 885		OEL CE	1 461	115		4 354	-			91 381	168	63ē
a D	TOTAL PERIOD 2000S7	676	23.781	, ,21;	<1r,::	1.1 •• 3	45 885	411417	3.1"7221	17, 215	155 0484	1 850	ilig-t;	1,241,346	5:"(;""	3 125	51=	7	Ti grat 190	359 <b>lei</b>	643.3
ERIOU) I	th - Sith ölecontammükitiQn																				
tili,cj ki	Ohrest Decommissioning Activities																				
sposal o	f Plant Systems																				
	Auxiliary Instrument Air (shared)	-	23		-	-4			3	200			7.50	_*/		-				725	
112	(-).(119r, Instrument Afrikkared) RCA	~	28	<	1	22			1)	62	t:			2.40	-	-			p!	tlo.	
113	E'tell ,rD &I ,!tulle <j,< td=""><td>-</td><td>768</td><td></td><td>47</td><td>655</td><td></td><td></td><td>29-1</td><td>1.745</td><td>1"'4-</td><td>(<del>-</del>)</td><td></td><td>* 155</td><td>-</td><td>-</td><td></td><td>-</td><td>I'E'1",J</td><td>156"}</td><td></td></j,<>	-	768		47	655			29-1	1.745	1"'4-	( <del>-</del> )		* 155	-	-		-	I'E'1",J	156"}	
1114	Chilled Water (shared) RCA		112	- 2	à.	1.45			4	290	3-i	-		1.37e		-		-	55 943	7.605	
1.15	Component Caoling		T.		-	,				94	-		51	-	-	-			-	:3,4	
	Component Cooling RCA		116	2	3	130			4.9	iO'	300	-	-	1-4qC	-	-	-		58.079	16it:	
1.1 1.6	Compressed Air (Shared)	×	39		-	-	-		E	1005			84		-	-	-	-	-	1 :?J€	
			269		•	Z:,			1%	6.10	f63			2.455		-			99.688	t; (.H	
3 1.7					11	11.5	83		5.4	109	JAS			1611	293 1	2	2		SE 248	2 705	
1718	Compressed SM(shared) ROA		1::1)	5					4437	1,201	-		1:201	-							
9317 1718 2119			1:046					-							-			-	_	29.289	
9317 2718 2119 2110	Compressed Automated; RDA Lore Flood	:			Iş.	·F.	22	-	10	5-85	565	140	1,000	1 H)J	470	-			el.J 422	5 623	
0117 0718 0119 0110 0111	Compressed Automared; RCA Lore Flood Electrical (Clean) Electrical (Contaminated)	:	1,946	3	Iç af	' <b>F</b> :	52	-		585	565	(E)		1 H)J		-	-	į	el. 422	5 ft2'3	
0317 0718 0119 01110 01110	Compressed Auranaredi REA Eure Flood Electroal (Clean) Electroal (Centaminated) Electroal (Contaminated) Electroal (Contaminated)	-	1;246 2⊲1j	-			32	- 1	1.O 6.431	545 3 926						-		1	ell 422 774 395	<b>■ fi23</b> 35 254	
0317 0718 0119 0110 0111 0111	Compressed #Musmared; RCA Love Flood Electrosi (Clean) Electrosi (Contaminated) Electrosi (Contaminated) Electrosi (Contaminated) Fluel Oil (shaped)	-	1,9.lf. ;⊲1j 14e-1	36 25		1 735	92	:	1.0	585 3 926 81	565 1'324	-	12	1 H)J 19 069			# # #		<b>ell</b> 422 774 395	5 fi2"2 35 254 t Sil3	
0 3 1 7 0 7 1 8 0 1 1 9 0 1 1 1 10 0 1 1 1 1 12 0 1 1 1 13 0 1 1 1 14	Compressed #Mushared RCA Cure Flood Electrical (Clean) Electrical (Contaminated) Electrical (Contaminated) Electrical (Contaminated) Fuel Oil (shared) Fuel Oil (shared) Fuel Oil (shared)	-	1;5lf5 ;⊲1j 14e}1 ;∃	39 39	æf .	1,735		:	10 64n 5	565 3 926 81 21	565 1%34 - 27	(a) (a) (a)		1 H)J 19,069 -	17.3 -	-	* * * * * * * * * * * * * * * * * * * *	*	<b>6U</b> 422 774 395 4 488	5 fl22 35 254 t Sil3 273	
0 3 1 7 0 7 1 8 0 1 1 9 0 1 1 3 10 0 5 1 1 1 0 1 1 1 1 2 0 1 1 1 1 3 0 1 1 1 1 4 0 1 1 1 1 5	Compressed #M.smared; RCA Love Flood Electrosis (Clean) Electrosis (Clean) Electrosis (Contaminated) Electrosis (Contaminated) Electrosis (Contaminated) RCA Fuel Osi (shared)	-	1,6.lf6 3⊲1j 14e-1 ;-l 13	9 29 0	af . 0 45	1 735 10 11			1.0 64n 9 139	585 3 926 81 21 t J22	565 1321 27 1 022		511	1 H)J 19 069 - 111 154	17.0 - - 1 b69	- - - - - - - - - - - - - - - - - -	* * * * * * * * * * * * * * * * * * * *	: : : :	elJ 422 774 395 4 488 1795Der	5 first 35 254 t Sils 2"% 8 642	
0 3 1 7 0 7 1 8 0 1 1 9 0 1 1 3 10 0 5 1 1 1 0 1 1 1 1 2 0 1 1 1 1 3 0 1 1 1 1 4 0 1 1 1 1 5	Compressed Allushared RCA Cure Flood Electrical (Clean) Electrical (Contaminated) Electrical (Contaminated) Electrical (Contaminated) Electrical (Contaminated) Electrical (Contaminated) Fuel Oil (shared) Fuel Oil (shared) Fuel Oil (shared) Fuel Oil (shared) Hgft Pressure Impection		1,0.46 246 1461 141 19 163 892	29 0 41	af 0 49 314	1735 10 1156			10 6an 9 139 870	5/5 3 926 51 21 t J22 SS!M	565 1324 27 1 022 5 584		5.1	1 H)3 19,069 11: 554 17,713	17.3 -	- - - - - - - - - - - - -		***************************************	elJ 422 774 395 4 488 17!ISD#F 1 439 297	5 ft?2 35 254 t Sil3 2"3 8 642 2.26T?"	
0 1 1 7 0 1 1 8 0 1 1 5 0 1 1 1 10 0 1 1 1 12 0 1 1 1 13 0 1 1 1 14 0 1 1 1 15 0 1 1 1 16	Compressed #M.smared; RCA Love Flood Electrosis (Clean) Electrosis (Clean) Electrosis (Contaminated) Electrosis (Contaminated) Electrosis (Contaminated) RCA Fuel Osi (shared)		1,6.lf6 3⊲1j 14e-1 ;-l 13	9 29 0	af . 0 45	1 735 10 11			1.0 64n 9 139	585 3 926 81 21 t J22	565 1321 27 1 022	-	511	1 H)J 19 069 - 111 154	17.0 - - 1 b69	1		* * * * * * * * * * * * * * * * * * *	elJ 422 774 395 4 488 1795Der	5 first 35 254 t Sils 2"% 8 642	

Table C-3
Oconce Nuclear Station - Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						OffSite	LLRW				'Re	Spent Fuel	Silt	Pu)Cossod			olumes		Burial /	D 10	utilli)j ilnd
Activity		O#;wn	R(III1\oi)\ad	Packaging	Transport	Procesuing	Disposal	Other	fotal	Total	Lite. l'ulm.	Management	Relatement	Volume	Clasu A		Class C	aTec	Processed	Crafft	Conft, JuClion
Index	Activity Description	C'OS!	Cost	cost,	Costl&o	Costs	CQ'1.IS	tous	Contingency	Cossits	CotJ1s	Costa	Costs	Ctt. Feet	Cu Fn1	Cu, Feel	Cu. Feel	Cu. Feet	Wt., Lba.	blt(ij1hO\HS	Milf1hours
heposal	(PtaF\I Systems (continued)																			-22	
	Instrument Air (shared) RCA		145	3	4	155	(5)	101	62	J 19	107:9			1112:	-	*			T3 Eci5	Line	/
201,11:1	Lellik Test Rate (shared)		56	300	-5				•	S.0	10.50	-	54			-	-			t £-e	
	Liquid Waste (snared)	973	1 166	109	137	22.	330		1 07.7	4,529	4 6:<9			6:0:2:1	4£004	-	-		532 676	"iJ 1)c.	
	llq\lld 'fiii'.1!" O.posa	• :9B	• .115	733	150	300	1.081		1;381	'ieti<:;	5 IIC9	-	-	3300	0923	-	-		529 784	55 J9's	-
	Lawerl*uwn/H,r:;I'V;	100	518	50	E5	≘18	506	000	".dt://;	::0:;"	2.017	-	-	5 6"	2 772	*	-		463 289	113 232	
	Low PHS-illn: Ser; Joc (\atti (shared) RCA	(*)	lje3	3,4	55	2 205			697	4,448	4 425	-	4.	25 228	-	-	-	-	1 024 540	12 :,f=	-
	On-Site/Off-Site FO-Wer		94	-				-	34	108	-		rle	~	-	-	-		-	2.5.17	-
	Plant Drinking Water (shared)	-	121	-	•			-	20	151	330	-	157		-	-	-	-	-	4204	-
	Hun: Heatiffy Sjitsim Hiblifred 7-22	-	108	1	2	91	-	-	40		245	-(1		1 005	-	-		-	40.769	21470	-
b 1 : 29		-	143	7	21	4J2	-	-	196	712	712	27		4.842	-	-	-	-	198 £A1	3'5'51	-
	RFS Refueling Watter	-	45	4	4	26	25	-	23	129	129	-	5	31a	127	~	-	-	241.3146	; 0:0	
eo )1	RitU41t1on Iffrumfttflt Aluff)	-	91	-	16	-			1	1	•	-	t <sup>o</sup>	-3		=	-	-		2222	-
	Ra(l'.uon lt.li'umtn[ Alarm RC 4	•	29	0	.9			-		43	42		-			-	-	-	2'5t:0;	788	
	RU:IQI BUIU-'g CI).;jI.;'9	-	345	35	4.4	1,705	i.e.		):1	2/47/	2.471	-	•	15 746	-	-	-		701 247	e 761	
	RilolClor Coplant	Torr.	241	21	19	45	129	470	104	561	501	5.	K1	510	W3		8	-	80040	is 272	
	Reactor Codani &!Dtige	435	467	54	7.1	221	459	0.53	506	2.243	143		4	2 470.	2.696	-		*	pos 2JJ	J-1694	
	Rictor Coolant Trument (shared)	1037	151	IE	17	1:3	112	151	149	13/2	632			A, a	63.2		-		e8:"M	7,165	-
	Resin Recover(11strated)		5-±.r	38	ft:	207	541		1:01	1,748	7 i4‼o	-	5,	2 2 <b>7</b> 5	3,039	-	*	2	3-4-OJ-w	13.695	
	Sallila, f Wistel (shared)	-	.0	-			-	15	0.	80	•	-	80	*	-	100	-	5	7	2 135	100
	San-tar'( \VsK\!! fi.bilred, R:A		11	ű.	1	25	1.5	(20)	11	76	76		-	jJ		-	-		1:9-104		-
	&ear. « # All (shared) RO4	500	78	.03	- 2	60	(*)	1-1	28	16'	167			562		-	-	-	:"51:a.:	tOj.J:3	150
	Solidification 16naredt	824	940	106	134	226	909		SJ:	¢ 015	43.16		•	2 < 90	4744	-	-	-	51" &55	்றி 3J1	
	thlel: Fuil		e	-			-	0.0	1	37	-	-	11	-	-	=	-		-	1,0,1	
	\erti.&auO(lidi!ini		189		-	-		-	28	217	-	-	217		-	-	-			5 848	-
	Venlfttt-oft (cie3/11 RC.c.		"2	5	79	D5	2-1	-	***	***	/i2S	-	*	3 694		-		-	150 000	3 464	
	Venil&ition (contaminated)	-	<b>98</b> 6	15	2	S1JeJ	51	-	255	; HE	1.nG	¥1		8.891	262	-	-	-	354 549	13385:	
ti I I	Totals	Hii5	7; \$10	1 C'.J	₹ 3013	tJ 534	7.202	-	9741	52,342	50 204		2 iEA	40,777	38,620				B 345 791	469,544	-
20.1 12	Scaffolding In School of decommissioning	-	914	11.	a	97	12	-	248	1.2q1	1 293	2	12	tae	60		¥	-	46.735	28.236	
Decontam	ination of Site Buildings																				
2b 1.3 1	RUC:lor 9 <ali>Hi0ng</ali>	770	PIGO	1e:2	271	4124	sn		965	ц ,4/43	443	-	-	4tiSi	10890	8	8		341 440	37 959	
b.1.3.2	Auxoliary Building	J5*4	203	56	48	<b>&amp;I</b> ;	117	(5)	289	117G	!H(Ij	-	-	iC17	3 244		-	3	25:O:"1S	1JiJ1)	( )
b 1 %:1	ContantinaUKI Miss. IsliLictures leccr.moftl	15	- V	2	,		5.	-	1!	44	44		-		137		-	*	9 447	524	-
2b 1 3 4	IoUI MacMilMr Shop (common)	31	23	8	10	17	17		.11	198.5	181		-	1&7	465		*		1SwJ	41010	, a
m 1.6.5	IntNm/\ Raay,tstt/ 3u/fdlflg !CorTt/TiJn I	'03	Y <sub>3</sub>	16	7a	15	J.4	-	11	1."9	329		-	10-3	937				;;329	J'17.A]	
Cit. 3 fj	fiao-a;alu: Fircibi; ic.a	370	,N-	48	71	217	702	7.00	340	1 475	1 4HS	81	-	L 360	263		-		278 709	3.5 .J<1	
2b: J.	Rfi(Irit) Sturr Gen Storage Fae Iccm*IQtio	8" -:1	2	3	- 3	2	4		a	15:	1\$7		-	18	125	-	-		9 :r'y	2 492	
	Turbine Building		24	5	5		11	-	1929	3917	Jjil		-	17	:n4		-	4	21.70-8	6 117	
b 1 J	fWD	₹ 9TB	15.1	320	25	139	1:261	-	1 889	8,19/5	81195			B 125	18 7Sw	-	-		1 523 1452	62 572	
b t	9K.bisilli Period 26A9:1171fy (Mats	\$(169014	16 245	1 351	1 645	14 170	\$J.7:	-	nt'S	61 830	<b>5</b> 9 693	-	2 138	151,865	!,,43C0	-	-	-	11,018,480	580,353	
	Additional C:sel·A														200						
10.2.1	(Jt,latithtieff! h≒l,r,t Remedi;fittin	°2	-	-	12		\$50	818	59	21514	264	-		*	452	-	-		-	eoo	
b 2 2	CalMM IncPlifting Range Closure			-	12	-			pe-	Avc	-	-	900				-	-	-		
kr,!	Salifical Period 25 Agamquai tVicti	54	-	~	1?		315	<b>H</b> 18	151	Its#e4	26:4	-	900	-	4152	-	-	-	-	Bca	-
	;; ollstend Costs			-					****												
D 3 •	P.OGru ItolUid w.#!Sit	n4		142	FØ3	-	1 508		f.,,p	3 46€	± ±1)0-;	-	12	5	4 105	-	-	2	j4."i92	800	(4)
6,3.2	Smile, tool #I )wil'≪t't		361		-		-		1;0	AET	457		-				-		-7	-	-
¢; j	Spent Fuel Capital and Transfer	•	-		-	-		00	84	61';-	-	E77	5	ě			*	2	*1	-	(2)
b.3.4	Spurity and Peleatist: Jf Sadjo Metal	-		2			1	OS,	84	6-1:	ea2						=	ä	1000	1314	127
1112	SutYAM Period 2b Collateral Costs	214	397	24::!	733		1 "J:"	10.7.4	900	52411	41565	1:{			2106	- 2	2	2	347 392	bC-3	1

Table C-3
Oconee Nuclear Station - Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	olumes		Butial /		utility and
Activity	1 2 2 4 2 3			Packaging		Processing	Disposal	Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
	Period-Dependent Costs																				
	Decon supplies	1 203						-	301	1,504	1 504			1		-			-		
4.2	Insurance	-		3.5	101			558	66	724	724.				-	-		0.00			
243	Property taxes		7		0.50		(7)	1.791	179	1.970	1.970		1.00	-		170	125		-	300	
4.4	Health physics supplies	-	3 412						853	4.265	4,265			-		-		5-0	-	150	
	Heavy equipment rental	-	4.488	-	450	120		-	673	5 161	5.161		100	-	-			100		(-)	
146	Disposal of DAW generated			133	113	:=:	532		113	691	691	-	100	-	7.684	-	100		157 685	287	-
147	Plant energy budget			140	370	-	161	2.040	306	2.346	2,345			-	-	-		-			-
1.4.8	NRC Fees		-	1-0	1.0	(*)	14.0	926	93	1.019	1.019			ž.		-	*1		-	-	
0.4.9	Emergency Planning Fees			1+1	1=0	365	-	577	58	535		635	-	-		-	-	340	2	140	-
4 10	Spent Fuel Pool O&M	-		1.0	3-0		(4)	1.532	230	1762		1.762				-	194	100			
0.4.11	Liquid Radwaste Processing Equipment/Services			-	100	-		385	58	443	443				-	-	0.00	141	× 1	(=)	
0.4.12	ISFSI Operating Costs	(*)		121	7.0	(+)		224	34	255	100	258			-	-	14	-		-	
	Indirect Overhead	-			100			5 093	764	5.857	5.657							-			
	Security Staff Cost	-				191		8 645	1 207	9 255	9 255			- 1			12	120	2.0		271.071
	Utility Staff Cost				-			48 786	T 318	55 104	55 104										850 714
5.4	Subtotal Period 2b Period-Dependent Costs	1 203	7.900	133	112		332	70.060	12.251	91 991	89.337	2 654		-	7.884	9	-	,	157 885	287	1 121 786
2.0	TOTAL PERIOD 25 COST	* 263	26 542	1734	2 702	14:370	tā 399.	72 025	25 191	160 227	153 859	3 330	3 038	157 868	69871		2		11 523 550	582 241	1 121 786
	c - Delay before Wet Fuel Storage Decontamination		70.0		20153						113			2000							
		*1																			
enod 2¢	Direct Decommissioning Activities																				
	Additional Costs																				
	Landfill Post Closure Maintenance			-			-	259	26	285			285		-	-		1-	-		-
6.5	Suptotal Period 2c Additional Costs		-	-		0.00		259	25	265			285	-	-						-
erind Ze	Collateral Costs																				
E31	Spent Fuel Capital and Transfer						-	2.116	317	2.434		2 434	_							2.00	
t.3	Subtotal Period 2c Collateral Costs							2 116	317	2.434	-	2 434			-	-		-	-		
eriod 2c	Period-Dependent Costs																				
6.4.1	insurance	19			-			2.006	201	2 207		2.207			9			121			
20.4.2	Property taxes				-			1.308	131	1 439		1 439		_						- 2	
£43	Health physics supplies		581			12			145	726		726			- 5	-		100			- 8
4.4	Disposal of DAW generated			1^	10	100	31	127	10	54		64			727	9	- 5	955 951	14 548	26	
c 4.5	Plant energy budget	-		180		12		1.658	249	1.907	141	1.907				5	5	A-51	114,574.0	20	5
c 4 6	NRC Fees	-					-	1 068	107	1.175		1.175	-								
4.47	Emergency Planning Fees	15	20	12		157	120	1.759	176	1 935		1 935	5	- 5				17		100	
c.4.8	Spent Fuel Pool O&M	(5)	- 5	-	-	1.5	15.	4.669	700	5.369	1.5	5 369	5				- 0			-	-
26.4.9	ISFSI Operating Costs			- 5	- 1			683	102	785		785	2			-	-				
	Indirect Overhead	•			-	-	-	1 616	242	1.859	17	1.859		-	-	-	-	-	-	-	-
c.4 11	Security Staff Cost		-		1.00	100		8 225	1 234	9.460		9 460	1	-	-		-	1.0			200 000
		-	9		100	1.5	-				17.1		-	-	-		-	1 = 1	-		277 586
C-4	Utility Staff Cost Subtotal Period 2c Period-Dependent Costs		581	12	10		31	14,962 37,956	2.244 5.542	17.206 44.132		17,206 44,132	-		727	-			14 549	26	270.009 547.996
			581	12									247								
10.11	TOTAL PERIOD 26 GOST	-	581	12	10		31	40,331	5.885	46.851		46 566	285	-	727			-	W 549	26	547 595
ERIOD 2	d - Decontamination Following Wet Fuel Storage																				
	Direct Decommissioning Activities																				
20.1.1	Remove spent fuel racks	197	20	77	43		301		193	331	831	-	-	-	1 540	-	-	141	138 215	501	2
haposal /	d Plant Systems																				
	Spent Fuel Coging	537	509	22	Té	322	494		584	2.577	2.577	2		1.541	2 506			320	370 704	18 125	2000
	Totals	537	589	52	78	322	494		584	2 577	2.577			3 543	2.606	-	-		370.704	19 325	
- 1		10047	993	-	1.5	76.4	4.54	-	354	×	6.917			2 243	2.000	-	-		370.704	12 060	

Table C-3
Oconee Nuclear Station - Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	olumes		Burial /		Utility and
Activity			Removal	Packaging	Transport	Processing	Disposal	Other	Total		Lic. Term.	Management	Restoration	Volume	Class A		Class C	GTCC	Processed		Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
Decontar	nination of Site Buildings																				
26 1.3 1	Fuel Building	761	298	7	10	118	15	-	229	938	938		8	1.293	291	9	ř	=	72.136	13 194	-
28.1.3	Totals	261	298	7	10	149	16	*	229	938	938		•	1.293	291		5	5	72 736	13.194	-
2d.1.4	Scaffolding in support of decommissioning		183	4	141	19	2		50	259	259			193	12		-		9 747	5 647	
2d.1	Subtotal Period 2d Activity Costs	995	1 011	140	131	469	814		1.056	4 605	4 605	-		5.029	4 449		-		591 403	38 767	
Period 20	d Additional Costs																				
2d.2.1	License Termination Survey Management Program	-	-	-	=	=		616	185	801	801	140	-	-			*	-			£.240
2d 2.2	Landfill Post Closure Maintenance	1941	34	-	-	-	-	22	2	24	-		24		9		-	-		-	*
24.2	Subtotal Period 2d Additional Costs	-			-			638	187	825	801	-	24				-		-	•	6,240
	d Collateral Costs																				
20.3.1	Process liquid waste	118	•	102	310		659	-	281	1.471	1.471	2	-		1 735	-		-	151 921	.338	
2d.3.2	Small tool allowance		32	200		5	-	-	5	36	36		#	10000	-	8		2			
2d 3 3	Decommissioning Equipment Disposition		-	109	29	805	73	147	124	940	940	-		6.000	373			- 5	303.507	88	
2d.3.4	Spent Fuel Capital and Transfer	-		-			-	112	22 17	169 128	128	169	Ä	4	-		100	*		-	•
26.3.5	Survey and Release of Scrap Metal Subtotal Period 2d Collateral Costs	118	32	211	340	605	732	258	449	2.745	2.576	169		6 000	2 108			-	455 428	426	
26.4.1	Penad-Dependent Costs	100							18	89	89										
2d 4.2	Decon supplies Insurance	- 1				-		169	17	186	186	-	-	-		-	-	-	*		-
2d 4.3	Property taxes			-				3	ò	4	4	-									
2d 4-4	Health physics supplies		384		-	-	-		96	480	480			-			-				
2d 4.5	Heavy equipment rental		1 155		_		-	3-6	-173	1 328	1.328		-	-			-				1-0
20.4.6	Disposal of DAW generated		THE COLUMN	21	18		54		18	117	111	-			1.271	×			25.414	46	
2d.4.7	Plant energy budget		-		-	-	-	280	42	322	322	-	-	-		-	-		-	-	340
2d.4.8	NRC Fees	-		-	-	-	12	238	24	262	262	100	-	-		×	-		120		12
2d.4.9	Emergency Planning Fees	12	=	-	=	-		149	15	163		163	-	-		v	-	- 2	141	-	191
2d 4,10	Liquid Radwaste Processing Equipment/Services	100	-	-	¥	-		198	30	228	228	-	~		-		-	-	-	~	2
20.4.11	ISFS) Operating Costs	-		-	Ÿ	-	-	58	Ð	66		66	-	-	-	~	2	-	-	-	-
20.4.12	Indirect Overhead	•				-		951	135	1.036	1 036		-	-			-		-	-	30.000
2d 4 13 2d 4 14	Security Staff Cost Utility Staff Cost		-	=		-		1,229	184	1,414	1.414		=	ē.)				-	-		36 670 150 540
20.4	Subtotal Period 2d Period-Dependent Costs	٦.	1 539	21	18	-	54	12 134	2 097	15.934	15 704	230			1 271	ž	-		25 414		187 210
2d C	TOTAL PERIOD 2d COST	1 184	2 581	372	489	1.064	1 500	13 030	3.789	24 110	23.687	.398	24	11.029	7 828			-	1 072 245	39 240	193 450
PERIOD	Ze - License Termination																				
Period 2s	Direct Decommissioning Activities																				
26.1.1	ORISE confirmatory survey	160				-	1-1	150	45	195	195			-		-		-	-		250
26.1.2	Terminate lidense									3											
20.1	Subtotal Period Ze Activity Costs			-		*	-	150	45	195	195	-		-	-			=	-		
Period 2r	Additional Costs																				
26.2.1	License Termination Survey	12	4	-	-	-	1-	5 B49	2.055	8 904	8.904	101	-				-		141	171,046	3.120
2e.2.2	Landfill Post Closure Maintenance	140	9	-	2	-	140	31	3	34		-	34	-	-		-		-	427.7	
2e.2	Subtotal Period 2e Additional Costs	-	•	*	-		121	5 880	2.058	E 938	8.904	-	34				-	•	-	171.046	3.120
Period 2s	Collateral Costs																				
2e 3.1	Spent Fuel Capital and Transfer		*	8	8	8		37	6	43	100	43		8					-		-
2±3	Subtotal Penod Se Collateral Costs	-	2	2	-			37	6	4.1	-	43	8	2	2	2	2	140	-		-

Table C-3
Oconee Nuclear Station - Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Part		PloceuOld	nicc	CHIEC																	
Period Capander Cass   311   22   7%   73   74   74   74   74   74   74   74	Manhours Mall																				
A	mannours man	100, 200.	03.764	ou. reet	Cu. Feat	Ou. Feet	Carron	00313	Cosn	Custo	Cost	Cuitandicies	Coays	t.O.O.O	tority	Copia	GO;;s	COA	0.031		
### Place of Table											0.201		70.00								
### PRINCE CONTROL STATES  ### PRINCE CONTROL STATES    10			*	-		-		-				22		-			-	*			
### Only Control Contr						-		-			-0.0			-			-	200			
Marie   Mari		:019		-		2110		17.0	-									1 500%	(*)		
### AF   Charging Planing Buck   255   1	n)	:019		-	100	11:5		000			n/li			113		-	15				
February   Flamman   Fla		(9)		-			-		*						-	(4)	(*)				
### SESS Confidenting Colories  ### SESS Confidenting Colories				-	-	-	-		- 10					-	-	-	-				
### Pasked Overheads   11				-	-	-		-	7.0					-	-	-	-				
SECONY, STREE Data   1980	-		-	-	-		-		194					-		-	-	-			
LIMITY STATE AGENT  SECRET AGENT AGE		-	-	-	-		-	-						-	-	-			-		
## Substant Record by Person-Corporating Clastry 150 6 11 15 11 10 100 settled 1419 122		•					-	-			9.453			-			-				
STOPPA, PERIOLEO DOST		5.979	-			246	-	-			sol-tielli			4.5	-			• 166		Eustated Bloom 2s Senser Department	e.t 1.
PERIOD 2 TOTALS	12	2919				349			122	101 2 3	O	1 525	3.10	524		- 11	. 0	169	*	Suctoral Peroci 2e Period-Gepende, it adea	-
Personal State   Pers	:-'lol'SIIIi	ti!!!lg.				).43	~	31	165	21 264	;;.4Q	4 034	18 397	15	*	, 5	3	1 005		TOPTEL FERIC LIC DOST	a D
Demotion of Remaning Ste Bullangs   3   114   1731   173	1 151 751 2 6	24 5 11 520		517	3 h25	<i>UE</i> 653	2-91 359	7.657	52 309	366 304	426 <b>≱-7</b> 3	74 021	H60 100	97 <b>J</b> II	27 559	8 502	11 151	54331	9.352	2 TOTALS	PERIOD 2
Permaneng Site Buildings   3																				3t) - 51\s Relito/allion	PERIO!) 3
Rendron Burking   A 731   Point Burking   A 731   B 735   B 731   B 735   B 731   B 735   B																				::Cirect Decommissionied Anti-GIA	Facilité disci
Reactor Buckleng																				n of Remaining Site Buildings	Demoisson
District   Administration Building (common)   117   18   135   1	(3L)<(5	-			7.00		-	4 701			i 13 1	61.7		-				6.114			
Dec   1	2 539		1.00		(4)							18		-		-		117			
Spiral   Clean Macs Rife Structures (common   5-97f   850   6-80A   6-821	,"0.7:;			-	1-1			1.289					*			-					
10   12   12   13   14   14   15   15   15   15   15   15	80:225		190		-		-	6.821			6 ollu		**	:= /	3.0		1-1			Clean Misc. Site Structures (common)	D1 1 4
St. 110   Contaminated Misc. Structures (common)   10   3   14   34   34   34   34   34   34	2 940		100				-	1,42		-	341Z	45	42	-	-		100	:'98	-		
Bill   Essential Siphon Vacuum Blog (common)   33	tr-	2			-	2	-	24		747	F4-	3		12			14			Contaminated Misc. Structures (common)	t:1170
Sanit   Hot Machine Shop Learmon   Substitute (common)   Substit	1.048	-		14	120	-	-	le!			16	22		-		12	1.0			Contract Services Building (common)	b), 17
0   1   1   Interim Radvaste Bluklung (common)	604				141	2	2		-					-						Essential Siphon Vacuum Bldg (common)	b 1 1e
10   1   1	; Q3S	-		-	(4)	-			9		124		36	-		-	-	:JIJ		Hot Machine Shop (common)	Sinni
Dilify   Maintenance   Support Building   common   Maintenance	45 OH	4		-		8	-		8									'D1		Intake Structure (common)	b 1 ' '0
13   13       14     15	90n					-	-									-		445			
1   1   2   2   2   3   3   4   2   3   2   4   2   3   3   3   3   3   3   3   3   3	2154)	*			-	-				-				-	-			130	-	Maintenance Support Building (common)	3D 11 "Z
10   11   15   Service Building (common)	tf,9.1:J	-		-	-	-	-					0./		-		951	-		-		
1	23.191			-	-		-		*			280		-	*	(6)					
Self-197   Standby Shuddown Facility (common)   492   129	1 \ 110			-	-	-				-	:!>4			-		15			1.00		
Do 2   18   Switchgear Enclosure (common)   113   17   129   129   129   120	ti,11)					-	-		-					-	151	100	-				
Ito   1   Switznger House (common)   57   9   66   56   60	€ SSG	-	200		-	-	-		*	-				-	100	-					
0:1,120 Technical Support Building (common) 49 7 56 PJ 1113 121 1Adm 1818 1815 122 Tuthine Building 158 212 Tuthine Building 158 178 179 179 179 179 179 179 179 179 179 179	1971	-	1.0	•		-	-									-					
151122   Turbine Building	6113)	-				-	-			-				-			-				
ab.1.1.22 Turbine Pedestal     675     68     478     078       bit 1.7.22 Faet Building     669     999     920       ab.1 Totals     32.932     1HT Still4g     30,000	1 C)<	-			-	-	-			-				-		-					
16TI 123 Fuel Building 999 - 252*	11/1/1	-			-	-	-							-							
ubi 1 Totals - 32 % ;	H <sub>15</sub>					-	-						-	-	-	-			-		
	12 )19" :i:'t D03		-				-		-						-	-					
Ste Close of Actualies											_									eout Activities	Ste Cince
De 1 - The 1-Tiles	1867							<idc< td=""><td></td><td></td><td>2.806</td><td>340</td><td></td><td>100</td><td></td><td>_</td><td></td><td>2 266</td><td>-</td><td></td><td></td></idc<>			2.806	340		100		_		2 266	-		
St. 1.1. Great description but find the state of the stat	269						- 1									-	1		2		
	200											2				:					
Ht 1.3 Final report le NRS	;)li tiA]			Ž.	ž				-	52		3.501				-					
Period 31 Additional Costs																				Adiational Costs	Period 3h
20.2.1 Cancrete Crustvng 819	\$16,310				-		9				947	128	9	-	2	-	9	819			
36.2.2. Landfill Post Closury Maintenance	-				8	*	-	,∷>0			106	'C	96	12			8			Landfill Post Closury Maintenance	3b 2 2

Table C-3
Oconee Nuclear Station - Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed			/olumes		Burial /		Utility and
Activity	F-12/20 B-1/20-11	Decon		Packaging				Other	Total		Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
.2	Subtotal Period 3b Additional Costs	~	819	-		127	-	101	133	1 053			1.053	*	18			-		4,168	
	Collateral Costs		CONT. CONT.						HACE .				1020								
3.1	Small tool allowance		243	-	-		-	-	36	279	-	•	279	-		-	797	-			
3.2	Spent Fuel Capital and Transfer		To the same	-	-			115	17	132		132	-	-	100	-	12	0.00	2		
3	Subtotal Period 3b Collateral Costs	-	243	-			•	115	54	411	-	132	279	- 5	12	-		-	-		8
	Period-Dependent Costs																				
1.1	Insurance			250	(5)	1.5	150	668	67	735	0	661	73	270		-	-	(5)	8	*	-
2	Property taxes		*	1.51	-	(5)		15	2	17	J=0.		17		270	2.70	120	170		-	
3	Heavy equipment rental	200	6.792	1-1		(8)			1.019	7,611	-		7.811	-			10.50	15		3.50	
4	Plant energy budget	-	-	-	(*)			307	46	353	-	318	35	-	1.5	100	-		5	-	-
5	NRC ISFSI Fees		-	-		-	•	457	46	502	-	502				-	589	-		181	
5	Emergency Planning Fees			-	0.00		-	77	6	85		85	-	3 <del>-0</del>	3.0	1.0	1-1			-	
7	ISFSI Operating Costs	-	-	-		-	-	253	38	291	-	291		-	100	-	1-1	-			
8	Indirect Overhead	-	( a)	140		-	-	1.659	249	1.906	1.908			3-1	-	(+)	-	0-0	-	14	-
9	Security Staff Cost				(4)		-	5 303	796	6 099	(0)	4.269	1 830			-		-			157 300
10	Litility Staff Cost	140		(2)	-		-	16 831	2 525	19 355	Q	17.420	1 936	1.0	(4)	1-1	7.00	-	-	343	277 090
	Subtotal Period 3b Period-Dependent Costs	-	6.792				19	25 570	4 793	37 155	1.908	23 547	11 701	-	12	1-	-	-	-		434 390
	TOTAL PERIOD 36 COST	20	33 151		125		4	25 830	8.782	67 763	1 960	23.678	42 125		-	-	-		-	340 E17	435 058
IOD :	c - Fuel Storage Operations/Shipping																				
od 3c	Direct Decommissioning Activities																				
st 3c	Additional Costs																				
1	Landfill Post Closure Maintenance			-				50	€	62			62		9			-	2	-	-
	Subtotal Period 3c Additional Costs				-			56	6	62	-	-	62	4		1 = 1					
836	Collateral Costs																				
1	Spent Fuel Capital and Transfer	-		727				66	10	76	-	76		12			196			-	
	Subtotal Period Jc Collateral Costs			-		-	-	66	10	76		76	-	-	-	-	-				
# 3c	Period-Dependent Costs																				
1	Insurance	-	1.27	191		-	-	274	27	301		301									
2	Property taxes	-						6	1	7		7					19	120			_
	Plant energy budget			400	200	-		126	19	145	-	145	-	1901	201	167				-	-
	NRC ISFSI Fees		-	17.5	- 50			241	24	265		265		- 5			12				
	Emergency Planning Fees			100				95	10	105	-	105		15		140	100		-	141	_
5	ISFSI Operating Costs	-	657 100	-	-	- 5		104	16	119		119		100		1961	-	-	-	-	-
7			15			7.		88	12	92	-	92	-	-	-		-	-	-	-	-
	Indirect Overhead			270	-	.51	-	1.895	284	2 180		2 180	1.50	-		1.5	1.5		1	1.5	53.53
	Security Staff Cost			-										100	(2)		-	198	5	150	
	Utility Staff Cost		-	-	-	-	-	771	115	887	-	867	0.50	-			150	100	-		13,38
	Subtotal Period 3c Period-Dependent Costs	-		-	-			3.592	508	4,100	-	4,100	(5)	-	8.50	-		:-	-		66 92
	TOTAL PERIOD 3E COST	-					-	3.715	524	4.238		4 176	62	-	-	3.00	1.0	120	•	*	66 921
IOD 3	d - GTCC shipping																				
ud 3d	Direct Decommissioning Activities																			İ	
	team Supply System Removal																				
1.7	Vessel & Internals GTCC Disposal		-		-	-	9.749	-	1.462	11,212	11,212			-	-	-	-	440	79.646		
	Vessel & Internals GTCC Disposal Totals Subtotal Period 3d Activity Costs	:		-	-		9.749		1 462 1 462	11.212	11,212			-	12	12	-	440 440	79.646 79.646		

Table C-3
Oconee Nuclear Station - Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Sitte	LLRW				NRC	Spent Fuel	Site	Processed		Burial V			Burial /		Utility and
Activity Index	Activity Description	Decon	Removal Cost	Packaging Costs	Transport	Processing Costs	Disposal Costs	Other	Total Contingency	Total	Lic. Term. Costs	Management Costs	Restoration	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet		GTCC Cn Feet	Processed Wt., Lbs.	Craft	Contractor Manhours
Index	Activity Description	COST	COST	COSIS	00313	COSIS	COSIS	COSIS	Contingency	COSIS	COSIS	COSIS	Costs	Cu. reet	Cu reet	Cu. reet	Cu. reet	Cu. Feet	WC, LUS.	Maintours	Marinours
	Additional Costs																				
	Landfill Post Closure Maintenance	-			9			2	0	2 2		-	2	-			-	3			
4.2	Subtotal Period 3d Additional Costs						-	2	0	2	=	-	2			•					
enod 3d	Penod-Dependent Costs																				
447	Insurance		-	100	-		-	11	1	12		12	1.5		1.0	1-1		120			
0.4.2	Property taxes				-		-	0	0	0		0					(*)	-			
d 4 3	Plant energy budget	-			-	-		- 5	1	6		5			-	-	100	-			
d 4.4	NRC ISFSI Fees					-	-	- 8	- 1	8		8	140							180	
0.45	Emergency Planning Fees							-4	0	4		4					190	14.0			
d46	ISFSI Operating Costs	-	-		-	93	-	4	4	5		5	100				-			-	-
0.4.7	Indirect Overhead	-	-	(4)	5-0	*	-	3	20	4	-	4	500		-			240		-	
d 4 B	Security Staff Cost	141			140	-	-	76	11	88	4	88	90	20	14	100	-	140		-	2.160
4.49	Lithity Staff Cost	( · · ·			-	-	140	31	5	36		36	120	100	12	-	121	140	121		540
d.4	Subtotal Period 3d Period-Dependent Costa	- 2	20		-		-	140	50	163	-	163	~	-		121	120	120	721		2.700
d 0	TOTAL PERIOD 3d COST						9.749	144	1.483	11.376	11 212	163						140	79 546		2 700
0.0	TOTAL PERIOD 30 COST	*			-	-	5 (45	144	1 403	11-370	10212	103	4	*			•	220	13.040		2 700
ERIOD	3e - ISFSI Decontamination																				
enod 3e	Direct Decommissioning Activities																				
enod 3e	Additional Costs																				
e 2.1	ISFSI License Termination	( <del>-</del> /	2.395	12	91	-	1.628	1.252	1.206	Ti 585	-	6.585	1.0	-	9.342		1-1	1-1	1.815.475	47.563	2 550
+22	Landfill Post Closure Maintenance		-		-	-	-	14	1	15		-	15						*		
e 2	Subtotal Penod 3e Additional Costs		2:395	12	91		1.628	1.265	1.210	6,600		6.585	15		9,342			-	1,815,475	47.563	2.560
Period 3e	Collateral Costs																				
e 3.1	Small tool allovance		35			1-0			5	40	_	40									
e.3	Subtotal Penod 3e Collateral Costs	1-	35		-			-	1	40	-	40		-						1410	
lanted 2s	Penod-Dependent Costs																				
e 4.1	Insurance							97	115	107		107									
e 4.2	Property laxes		-		-		-	1		2		2		-	-	-	-	-	-	•	-
6.4.2	Heavy equipment restal		294		-		-		44	338		338	-	-	-		-		-	-	
le 4.4	Plant energy budget		234		-		-	45	- 3	51	-	51		-	-	-		-	-		
ia 45	NRC ISFSI Feen				-			55		73	-	73		-		-	-		-	-	
a 4.6	Indirect Overfield						-	23	3	27	-	27	-	-	-	-	-	-		8	
e 4 T	Security Staff Cost			1.5			-	186	28	216		216	-	-	- 1	-		-		-	5.096
le 4 B	Utility Staff Cost						•	227	34	261	-	261			-	-		3.51	-		3.866
e 4	Subtotal Petrod 3e Period-Dependent Costs		294					548	133	1.074		1.074	i.		3					-	8,961
e o	TOTAL PERIOD 34 COST		2 723	12	91		1 629	1.913	1.348	7.714		1699	15		9.342		-	-	1.815.475	47 563	11 521
FRIOD	3f - ISFSI Site Restoration																				
	Direct Decommissioning Activities																				
	Additional Costs																				
121	ISFSI Demoktion and Resturation		990		100		(8)	39	354	1,183	100	1.163	1.50	-				196	-	7 578	160
122	Landfill Maintenance Perpetury	100	-				260	348	35	383	180		.383							-	
12	Suttotal Period 3f Additional Costs		990	-	(*)	18	7.0	387	189	1.566		1 163	383	-		*		-	,	7 678	100
enod 31	Collateral Doets																				
13.1	Small tool allowance		5		1.0	1-1	(4)		ï	6	-	- 6					100			-	
113	Subtotal Period 3f Collateral Costs		5					060	1	6		6	-	-				-	100		
	Continue of section of section of the section of											- 9									

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Table C-3 Oconce Nuclear Station - Unit 3 DECON Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial \	/olumes		Burial /		Utility and
Activity	Activity Description	Decon	Removal Cost	Packaging Costs	Transport	Processing Costs	Disposal Costs	Other	Total Contingency	Total	Lic. Term. Costs	Management Costs	Restoration	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contracto
	Penod-Dependent Costs																				
3/4.1	Insurance	-				5	17.1			101	(5)						-		-	-	
314.2	Property taxes	6.5	Face		51	50		1	, U	1.		1		-		-	-			-	-
	Heavy equipment rental:		.06	*	1,5	(-)			14.	111		111		-		2	-	~	-		
3144	Plant energy budget				1.5	151	( • )	22	3:	25		25					-	-	-	-	(+)
31.4.5	Indirect Overhead				181	18		Ų.	1	75		11			-		*	=		-	
31.4 €	Security Staff Cost	-			0.00	0.00	-	93	14	107	-	107				-	-	-	-	-	2.52
3147	Utility Staff Cost	-			181	0.00	1-1	95	14	109	-	109			*	-		-	-	*	1.56
31.4	Subtotal Period 3f Period-Dependent Costs		96		(=)	(*)		220	47	364	-	364	**	- 1	-	-	-	-	-	-	4.09
31.0	TOTAL PERIOD 31 COST	2	1.091		100	190		807	237	1.936	-	1 554	383	ų.				-	-	7.678	4 25
PERIOD 3	TOTALS	2	36 965	12	9.1		11.375	32,216	12 373	93 028	13 171	37.270	42 587		8 342			440	1 895 121	196 098	520 45
TOTAL IN	OST TO DECOMMISSION	12.173	96 774	tii 236	7 059	27 659	T3 885	283 964	99(346)	612 096	455 945	92.545	50 503	297.359	172 537	3 867	517	440	26 851 350	1 592 712	4 072 82

TOTAL COST TO DECOMMISSION WITH 19.38% CONTINGENCY	\$612,096	thousands of 2	308 dollars
TOTAL NRC LICENSE TERMINATION COST IS 76.6% OR:	\$468,948	thousands of 2	308 dollars
SPENT FUEL MANAGEMENT COST IS 15.1% OR:	\$92.545	thousands of 2	008 dollars
NON-NUCLEAR DEMOLITION COST IS 8.3% OR:	\$50,603	thousands of 20	008 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	176,940	cubic feet	
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED	440	cubic feet	
TOTAL SCRAP METAL REMOVED:	66,307	tons	
TOTAL CRAFT LABOR REQUIREMENTS:	1,592,712	man-hours	

End Notes

n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0 5 but is non-zero
a cell containing " - "indicates a zero value."

## APPENDIX D

## DETAILED COST ANALYSIS

## SAFSTOR

Table		Page
D-1	Oconee Nuclear Station, Unit 1	2
D-2	Oconee Nuclear Station, Unit 2	13
D-3	Oconee Nuclear Station, Unit 3	24

Table D-1 Oconee Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

			_			Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial	Volumes		Burial /		Utility and
Activity	Activity Description	Decon	Removal Cost	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	Other	Total Contingency	Total Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet		Class C Cu, Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contractor Manhours
PERIOD	1a - Shutdown through Transition																				
Period 1s	Direct Decommissioning Activities																				
12.1.1	SAFSTOR site characterization survey		-	-	2.	+-	_	361	1114	495	495	-	-	(*)	141	20	-	-		-	-
1812	Prépare préliminary decommissioning cost	-		2			2	88	13	101	101	-	-	~	-		-		121	-	1 300
ta 1.3	Notification of Cessation of Operations									- 2											
12 1 4	Remove fuel & source material									19734											
ta 1.5	Notification of Permanent Defueling									- 4											
1a 16	Creativate plant systems & process waste. Prepare and submit PSDAR							135	20	156	156			66	1992			1007			2 000
1a 1.8	Review plant dwgs & specs			- 2		- 1		86	17	101	101										1 300
	Perform detailed rad survey							3734	1.0												
	Estimate by-product inventory							66	10	78	78				-	2	-	-	-		1.000
18 1 11	End product description		-			-	-	68	10	78	7.8	370	-	150	150	Ξ.					1 000
18.1.12	Detailed by-product inventory		-	-			-	101	15	117	117	3.00		(*)	1.53		(2)	-	200	-	1 500
	Define major work sequence	-		-	-	-	-	68	10	78	78			0.00	14.	(=0)	-				1 000
	Perform SER and EA	-	-	-	-	-	-	210	31	241	241	1-1			-		-	(7.1	-	1-1	3 100
1a 1 15	Perform Site-Specific Cost Study	-	-	-	*			338	51	389	389			-			-	-	-	-	5,000
	peofications																			1	
	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	333	50	383	383	120		(-)	-	-		-	200	-	4.920
	Plant systems		-	-	-	•	-	282 211	42	324 243	324 243	-		-		-				-	4 16T 3 120
	Plant structures and buildings Waste management		-	-	-	-		135	32 20	156	243 156	-	-			-	-	-		-	2.000
	Facility and sae dormancy			-		0		135	20	156	156		-			-			-	-	2 000
1a 1 16			- 1	-	į.	-	ŝ	1 096	164	1.260	1.260		4			-	-	-	149		16 207
Tietaded t	Nork Procedures																				
	Plant systems		-	-			-	80	12	92	92			-			2	-		127	1 183
	Facility closeout & dormancy	-			-		-	81	12	93	93			100			-	-	-	-	1.200
18 1.17	Total		-	•				161	24	185	185	181	-		(5)	200		15	-		2 383
1a 7 18	Procure vacuum drying system	-	-	-			-	7	1	8	8		-		-	-			:=:		100
	Drain/de-energize non-conf. systems. Drain & dry NSSS									a											
	Drain/de-energize contaminated systems									a											
	Deconsecure contaminated systems									a											
1a.1	Subtotal Period 1s Activity Costs	i Çi	-	-	-		-	2.808	478	3.266	3 286	141	-0		(*)	(**)		-	-		35,890
Period 1a	Additional Costs																				
14.2.1	Asbestos Remediation		2.758	1	263		2 164		1.273	6.481	6.481	-	-	-	25 455	-	-		330 915	35 451	
18.2	Subtotal Period 1s Additional Costs	-	2.759	,	283		2 164		1.273	6.481	E 481		*	*	25 455		-	120	330 915	35 451	
	Collateral Costs																				
	Small tool allowance		42	-		*	8		5	48	48	5.00	-	-	-		-	-	101	46.1	
	Spent Fuel Capital and Transfer	(2)	- 5.	-		×	#	1.248	187	1 425	*	1 435		-	-	-	-	-		*	-
18.7	Subtotal Penod 1a Collateral Costs	(5)	42					1 248	193	1.483	48	1.435		-	•	•	-	-		-	-
	Period-Dependent Costs							-	99	852	275										
1a.4.7 1a.4.7	Insurance	-		-		-		1 386	139	1 524	852 1,524							-	-	46	
	Property taxes Health physics supplies	-	513	35		-	-	1 385	153	767	7,524					-		-	-		15
1843	Heavy equipment rental	-	458	-		-	- 1	÷	69	526	526		-	-				-	-	3	
7a.4.5	Disposal of DAW generated	-	700	1G	9	-	26		9	54	54	-	-		516	-		-	12.311	22	
	Plant energy budget			-				1 324	199	1.522	1.522					-			1.5	-	
	NRC Fees	1.0		-				706	7.1	176	776			(=)		-		150	100	150	
				-	:	:							**				-				

Table D-1 Oconee Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	olumes		Burial /		Utility and
Activity		Decon	Removal	Packaging	Transport:	Processing		Other	Total	Total		Management		Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
Period Ta	Period-Dependent Costs (continued)																				
18.4.8	Emergency Planning Fees	100						281	- 28	309		309		-		100	-			1-0	
18.4.9	FEMA Fees			(*)	100		1-	328	19	145	145	-		-				1.0		1-	
1a.4.10	Spent Fuel Pool Q&M	(*)	-	1-1	181	1	-	745	112	857		857		-		-	-				
19.4.11	Indirect Overhead	-			1-		9-1	2.597	390	2:987	2.987			-			-		-		
1a 4.12	Security Staff Cost			1.0				1,159	178	1.368	1 368	•		-			*	-	-		46.678
1a.4 13	Lithlity Staff Cost	-			190		-	23.876	3 581	27,458	27:458			la la	-				-		433 829
18.4	Subtotal Period 1a Period-Dependent Costs	162	1.071	10	۵	-	26	33 005	5 024	39 146	37.979	1 166		-	616				12 311	22	480 507
1a 0	TOTAL PERIOD 19 COST		3 872	12	292		2.190	37.061	6.969	50 395	47 794	2.601		-	36 071		-		343.226	35,473	516,397
PERIOD	16 - SAFSTOR Limited DECON Activities																				
Period 16	Direct Decommissioning Activities																				
	nination of Site Buildings.																				
1h.1.1.1	Reactor Building	759	-		-		-		379	1 138	1 130		*			3			8	15 093	
10.112	Auxiliary Building	291	-		-		-		148	445	.445	-	-		-		*			- ₹ 865	-
10 1 1 3		222			1.50	-	-		151	333	333				-		-	*		5.899	
	Fuel Building	201							100	301	301			1.0		-				4 427	
10.1.1	Tofals	1478			*			-	739	2.218	2.218		*		5.	*				37.217	-
16.1	Suptotal Period to Activity Costs	1.428	-	) <b>-</b> :	*				739	2.216	2.216	-	-	-1	-		*		-	37 277	-
	Additional Costs																				
10.2.1	Spent Fuel Pool Isolation		-		-		*	4.704		5.409	5.409		~	-					-		-
16.2	Subtotal Period 16 Additional Costs		,	•	-		-	4 704	706	5.409	5 409	-		-	-			-			
Period to	Collateral Costs																				
16.3.1	Decon equipment	683			-	-			132	1016	1016			-	-					-	
1032	Process liquid waste	93		1			5		113	540	540		-		563				39 804	129	
1033	Small tool allowance	(a)	26		-	5	-		14	30	30	•		199			-	9			
1634	Spent Fuel Capital and Transfer				¥	×	-	57	13	101		101	8	121	•	-		7			
163	Subtotal Period 1b Collateral Costs	981	25	35.	157	*	•=3	87	563	1.685	1.585	101			563			*	39 804	129	
	Penod-Dependent Costs																				
16.4.5	Decon supplies	582				8			170	852	852			17.5	-	*	-				
10.42	Insurance			-			-	195	20	215	215			152	-	-	-			•	2.70
1043	Property taxes	* 1						349	35	384	384	-		151	-	-					
10.4.4	Health physics supplies		2.0	-				-	69	345	345					-			-	-	100
1tr 4 5	Heavy equipment rental		:15	-		-			17	133	133	-		-			*	-		•	
7b.4.5	Disposal of DAW generated		-	9	ь	-	23		8	49	49			-	557				11 133	20	100
76.4.7	Plant energy budget	-		-	-	*		334	50	384	384		-	(=)			-	-	-	-	-
15.4.8	NRC Fees		-		-		-	178	18	196	196	7		-			-			· .	
16.49	Emergency Planning Fees			-	-	-	-	71	10	2B	-	78		-		×:		-	-	-1	-
16.4.10	FEMA Fees		-	-	-	-	-	32	3	37	37	-		-	-	-				-	
7b 4 11	Spent Fuel Fool O&M	-	-	-	-		*	188	28	216	700	216		-			-		-	-	(-)
10.4.12	Indirect Overhead			-	-	-		855	98	753	753			(*)		-	-		-		4.4 (0.00
1b 4 13	Security Staff Cost		-					300	45	345	345		-		-	-	-	-			11.765
10.4:14			204		-		- 22	5.018	900	6,921	5,921	500	-	(-)	557		-	-	44.000	700	109,349
112.10	Subtotal Period 10 Period-Dependent Costs	682	391	9	4		23	8.319	1.473	10.906	10.612	294	-	-	557		-	-	11 133	.20	127 114
in a	TOTAL PERIOD 16 COST	3.141	.417	49	125		196	13 110	3 181	20 219	19.824	394			1,220				50.937	37.427	121 114

Table D-1 Oconee Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

		1 27				Off-Site	LLRW				NRC	Spent Fuel	Site	Processed			/olumes		Burial /		Utility and
Activity Index	Activity Description	Decon	Removal Cost	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	Other	Total Contingency	Total Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contractor Manhours
PERIOD	to - Preparations for SAFSTOR Dormancy																				
Period 1c	Direct Decommissioning Activities																				
10.1.1	Prepare support equipment for storage		168		-				58	446	446					2				3 000	
10.1.2	Install containment pressure equal lines		32						5	36	36		_		- 5				-	700	
16.1.3	Interim survey prior to dormancy	-		-	-	-		133	220	953	953	-			-			-	-	14 101	
10.14	Secure building accesses									3											
tc.1.5	Prepare & submit interim report					18		39	6	45	45	*		-	-	-		-			583
1c 1	Subtotal Period 1c Activity Costs		420			(=)		772	289	1,481	1.481		-	-	-	-	-	-		17 801	583
Penna to	Collateral Costs																				
1637	Process liquid waste	115		47	140	140	206	-	135	545	645	-			793			-	47 568	155	-
tc32	Small tool allowance		3	-	-		-		- C	4	4		-	-	-	-	-	-		-	
10.3.3	Spent Fuel Capital and Transfer	-		121	121		-	87	13	303	-	101	-			-	-	2	-		-
153	Subtotal Period to Collateral Costs	116	3.	47	140		206	87	149	749	648	101	-	-	793	-	-	-	47,568	155	-
Period 1s	Penod-Dependent Costs																				
10.4.1	Insurance	2	-	-	190	-		195	20	215	215			9		2	2	2	-		
10.4.2	Property taxes			-	-	151		349	35	364	384					-		÷.	-		
10.4.3	Health physics supplies		193	-			-	-	48	241	247	-				-		H	-	-	-
10.4.4	Heavy equipment rental		115			15			17	133	133		-			-		-	-		-
10.4.5	Disposal of DAW generated	-	-	3	2		7	-	2	14	1.4	-	-	-	155				3 103	6	
16.4.5	Plant energy budget		-	-	-	-	-	334	50	384	384	-		-	-		-				173
10.4.7	NRC Fees			-			-	179	18	196	195			-		-	=	-			(5)
1c.4.8	Emergency Planning Fees	-			-	-	-	71	7-	78	-	78			0.6	-		-		-	3.50
1c.4.9	FEMA Fees				-	-	-	32	5	37	37	-		-		-					125
10.4.10	Spent Fuel Pool G&M.			~	-	-	-	188	28	316	-	216		-	-	-	-			-	1,00
1c.4.11	Indirect Overhead		140	-		1-	-	658	99	763	753			-		-		-	-1	-	175
10.4 12	Security Staff Cost				-		3.14	300	45	345	345	-	-	-	-	-	-	-	-		11,755
10.4.13	Utility Staff Cost		121		-	191	-	6.018	903	6.921	6.921	1.6	-	-	-	-				-	109,348
1c 4	Subtotal Period to Period-Dependent Costs	4	80£	3	2	120	7	8 319	1.276	9.915	9 621	294	-	-	155	-		*	3 103	6	121,114
1c 0	TOTAL PERIOD 1c COST	115	731	49	142		213	9 179	1.714	12 144	11.750	394		-	948	-	÷	-	50,671	17,961	121.697
PERIOD 1	1 TOTALS	3.258	5 020	110	559		2 599	59.350	11.964	82.758	79 368	3 390	¥	=	28 239	<u>.</u>		2	444.834	90.862	759,208
PERIOD 2	2a - SAFSTOR Dormancy with Wet Spent Fuel St	orage																			
Penod 2a	Direct Decommissioning Activities																				
2a-5.5	Quarterly Inspection									30											
2a 1.2	Semi-annual environmental survey																				
2a.13	Prepare reports									3											
2a 1.4	Esturninous roof replacement			-		(-)		351	39	300	300	(*)		-	-		-		-	-	124
2al1.5	Maintenance supplies	:-	2.0		3-6	3-7	150	1 370	342	1,712	1.712		5	-						-	
2a 1	Subtotal Period 2a Activity Costs	-						1,531	382	2,013	2013		-	-		•		-		-	**
Period 2a	Collateral Costs																				
2a31	Spent Fuel Capital and Transfer		-		100	191		3 432	515	3.947	-	3.947	-	-		-	-	-			lei
283	Suptotal Period 2a Collateral Costs	2			-	100		3.437	515	3.947	-	3.947	*	-	-	-		-	-		-
	Penod-Dependent Costs																				
	nsurance	-		12	7=1	-		3.492	349	3 841	3 335	506	-	-	~	-	-		-		141
2a.4.1							1709	4.756	476	5 231	78	5.154								2	740
	Property taxes			-		-		4 1:00				0.104	-	-		-	-	-	-	-	
2442	Property taxes Health physics supplies	8	1 511	- 72	- - 50		179	4,100	253	1,264	1 264 372	0.104	-	-	4 249		- :	-	84 957	158	

Table D-1 Oconce Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						OWEN	L V DIVI				NOC	Court Court	6.4.	Dranner		Physical	(allowers		David		11000
Activity		Decon	Removal	Packaning	Transport	Off-Site Processing	LLRW	Other	Total	Total	NRC Lic. Term.	Spent Fuel Management	Site Restoration	Volume	Class A		Class C	GTCC	Burial / Processed	Graft	Litility and Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs		Contingency	Costs	Costs	Costs	Costs	Cu. Feet					Wt. Lbs.		
Period Za	Period-Dependent Costs (continued)																				
28.4.5	Plant energy budget	(*)						2.885	433	3.316	1 659	1 659			-					-	-
28.4.6	NRC Fees	:::	-		-			2.196	226	2,415	2.415		1.60	-	-	-	*	*	-	-	-
2a 4.7	Emergency Planning Free			1.5	-	-	10.0	3.061	306	3.367	-	3.367		-	-		-	*	-	-	-
28,4.8	Spent Fuel Pool O&M		-	-			1.0	8 124	1 219	9.343	75.545	9.343	0.0	-		*	-	-		-	
28.49	Ingriect Overhead		-	(8)	-	*		2.812	422	3.234	1.369	1 865	-	-	-		-	-		-	-
28.4 10	Security Staff Cost	(4)	-	0.00		*	-	14.315	2 147	16.463	5.659	10.864	-	-	-	-	-	•	-	-	483,043
2a 4 11 2a 4	Unity Staff Cost Suprotal Period 2a Period-Dependent Costs		1 011	37	50	:	175	26.036 67.678	3:905 3:790	29,941 78,790	12 150 28 302	17 791 50 488			4 249		- 15		84.987	155	469 859 952 901
2a.0	TOTAL PERIOD 2s COST		1.011	72	50	-	179	72.141	10 687	84.749	30 315	54 434		•	4 249	-	-		84 987	155	952 901
PERIOD ?	2b - SAFSTOR Dormancy with Dry Spent Fuel St	orage																			
	Direct Decommissioning Activities																				
20 1.1	Quarterly Inspection									.35											
26 1.2	Semi-annual environmental survey																				
26,1.3	Prepare reports							44.0	4.7	3	400										
2b 1 4	Bituminous roof replacement	0.00			-	,	-	770	17	127	127			-	-		-	=	-	-	-
26 1 5 26 1	Maintenance supplies Subtotal Pened 2b Activity Costs							377 667	151	721 848	721 648	-						-			
											2.00										
	Collateral Costs							7400		1779		Taken 1									
26.3.1	Spent Fuel Capital and Transfer	-	-	-	-		-	406	61	467	-	467		-	-		-	-		-	-
2b.3	Subtotal Penod 2b Collateral Costs				•			406	51	457	•	46.7			-	-	-	-			-
	Penod-Dependent Costs							Terroritan	144	oures area.	77096	144									
26.4.1	Insurance		-	-	-	-		1 322	132	1 454	1.405	49	-		-	-	-	-	-	-	-
26.4.2 26.4.3	Property taxes	-	410		-			30	103	33 513	33 513			-	-	-	-			.,	
20.4.4	Health physics supplies Disposal of DAW generated	-	410	30	25	-	74	-	26	155	155	-	-	200	1 164		-		35,290	5.4	
26.4.5	Plant energy budget	-	-	30		-		608	91	699	699	-	-	-	1000	-	-	-	90,634	044	-
2b.4.5	NRC Fees	- 1		- 5				925	93	1.018	1.018	-		-	-						•
2b.4.7	Emergency Planning Fees		- 2	-		-	- 1	153	15	188	5.50.(4)	168			120						
2b.4.8	Indirect Overhead	-	2	-			-	917	138	1:055	577	478	-						-		-
2n.4.9	Security Staff Cost			-	-			3.048	457	3.505	2 384	1 120	2	-	-			-	-	-	65, 194
26.4 10	Utility Staff Cost	-	9			-		8 424	1.264	8.687	5.119	4 568	-	-				-	-	-	153,234
26.4	Subtotal Period Zo Period-Dependent Costs		410	30	25	-	74		2 320	18.286	11,902	E 384		-	1 764			-	35 290	64	
2b.0	TOTAL PERIOD 25 COST	-	410	30	25	-	Td.	16 520	2.542	19,601	12.750	5.851		-	1 764		-		35 290	64	239 428
PERIOD:	2c - SAFSTOR Dormancy without Spent Fuel Sto	otage																			
Period 24	Direct Decommissioning Activities																				
20 1 1	Quarterly Inspection									В											
25 1.2	Semi-annual environmental survey									3											
2:13	Prepare reports									a .											
25 1.4	Bituminous roof (eptacement			-		-		864	130	993	993			-		-					140
20 1.5	Maintenance supplies							4 529	1.132	5.562	5 6 6 2			-						-	121
2c.1	Subtotal Period 2c Activity Costs			-	~		-	5 393	1.262	6 655	6 655	-		-			-	æ	-		
Period 2¢	Period-Dependent Costs																				
2541	Insurance	-	2			-		10.024	1 002	11 027	11.027			-	-	141			~	2	-
2:42	Property taxes	-			u u	9		234	23	257	257	16	27			27		- 2		-	-
	Health physics supplies	+	3.028	-		-			757	3 785	3.785	4	20	20		2.1		- 1		8.1	-
2:43																					
2c 4 4 2c 4 4 2c 4 5	Disposal of DAW generated Plant energy budget		-	229	.53	-	578	4 770	194 715	1,185 5,485	1,185 5.485	-	20	-	13 532	-	-	-	270 635	493	

Table D-1 Oconce Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spfrrt Fuel	Site	Processed		Burial V			BUttal 1		U1JUry 10
Activity		Decton	Romov",,"	P&Ki)Qging		Processing	Disposal		Footh!	foul	Lic. form.	Idal'(atgl)ment	Restoration	Volume	Class A		Class C	Glee	Processed	Craft	Conitraic
Indes.	Activity Description	Cost	Co'l	Costs	C05-h	Costs	Costs	(-MIS	ConUngency	Cost	Cotts.	Costio	Costs	Cu. Feet	Cu_Fee1	Cu. Feet	Cu, Feet	Cu. Feet	WIL Lbs.	MI)ntlours:	Manbol
e «f 2r	Period-Dependent COOs (continued)																				
1.46	NRC Fees		-	-	-	-		018	oSJ!!	i 23J	7 23)			- 22		-	150	(*)	-	1.00	
20.4.7	Inal8'6:1 Overhead			-	-			3 937	590	A 5:27	4 £27		3.00	-	-	-	(*)	-			
2t 4.8	Seczi'l) 5thii Cost		*		-		(-)	16 269	2 dtl;;j	HI "m	6Wn,		283		1.70	1.50	181	-		-	375
t d ii	'Mit/Statte.Os.t	2	-			-		34 932	S 14C	40 "71	oWn,		-		-	151	(5)	(-)	18		"5";1
le ₫	Subtotal PGhliXt In: Fir-JPIII-ChtPMRO <tht costs<="" td=""><td></td><td>mC1</td><td>229</td><td>le.:"</td><td></td><td>'j-t</td><td>76.740</td><td>11 5E1</td><td>9"23"9</td><td>82'3H</td><td>-</td><td></td><td></td><td>1;J.5J.;</td><td></td><td>0.00</td><td></td><td>2 06;)t:</td><td>493</td><td>1D13</td></tht>		mC1	229	le.:"		'j-t	76.740	11 5E1	9"23"9	82'3H	-			1;J.5J.;		0.00		2 06;)t:	493	1D13
ÇC C	TCSAL PERIOD 20 COST		3 028	229	192	-	5iti	12:::331	12 882	'hi OJ'	99 034	-	~	2	115,32.	1-1			270,635	493	1CIJJ
PERIOO :	Z FOTALS	2	4-4311	330	277	-	824	171.394	26.1t	21;T.1 Jes	142,099	BA 285	-		19,546		(*)	1-	J?C 812	=12	2 225
PERIOO .	JN-fills/Mante Sine Following \$AFSTOR Dolmancy																				
FeNxi 3a	Direct Gecommussioning delivities							- 1													
:u 1 1	PlepaTif Pill,",",", o@o.;O",\n\w,ll.<""j1\T	2		2	-	91	2	88		H"i	10		-		12	121		-	_	(4)	11
Sat 2	Re-Vih. plant CfWg & specs.	-	-		-	-		311	47	3\$8	358				-	(4)	-	-	2	7=1	.11
Jtl!Z	()mit)rm edituad and "10" tel									300	000										
Ja 14	Eod prOlluci.::lf'Si¬'pila.n							OS	1.0	78	18			7.2		-		-			1:0
3465	Obtilized ti), (cificilat) inventory							d:	13	H:1	'0'		-			-	-	-		1-1	11
⊋a 1'≡	nHf.M (Toi)Uf 'AUrk sequence							587	7f;	583	sa.		-	-	-			-			7.5
ja)11	Beform S31 ano EA						-	z:m		1-11	2.0	_	-	-				-	-		alr
1i 18	Perform Site-Specific CISt Stoor		-			-		:3!S	51	389	3111	_	-		-		-	-			5.0
da 1.9	Prepare/submit License Termination Plan		-	-		-		277	43	3.11,	3		-		-	-	-		_	-	4.0
Sii 1 le	Religibility NRC approval of leministront plan							-	755	8	614										100
Actually Sa	pecifications																				
31 1 1 f	Re-activate ptaint & temporary facilities	-	20	<u>u</u>		-		498	7.6	S71	51'5	2	5'			-	141			)•1	7.3
	Ptil't intelleme:	2	120					lei;	42	324	200		32	190	( <b>=</b> (	197	141	540	-	-	4
	Relicio mtcmM5		-	9		41	-	480	72	-55-5	552	2		121	7.47	(4)	121	140		(4)	T
	Fauctor vessel			9	G.	120		we	66	.sX	SQ	9		12		-	121	-		-	6.5
	EiotolOVr=.u shielg		-		2			)4	- 5	3.9	39	9		12	125	92	120	-	2	125	5
	Skillit gilre!'aliPi							271	30	34)	:N)						12			-	3 :
	Reinforced concrete		-			-		'0\	16	124	52		6.0		12				2	-	Hig
	Moil'II TyrrnIV							E.		31	100		51		-	- 0			2		
	MH. Gg/lbftn"e's						-	73		21	-	-	11		-			-		-	1
	Plulifie slFUctur(!%5% t-Likhrkijto				_			311	32	241	1211		121					-		-	5.1
	1 NitSte management			-				311	4.7	358	35F.1						-	-		-	4.5
	FiGli", E. tj.lteCloeillr.t;l							6;		70	35		f	-	-	-	-	-			6
3a 1 11					-	-		2 650	464	3D)-9-1	2.723		3°C'	-	100	-	18.	-		-	211
Phononia -	& Site Preparations																				
	Pre-pale, µ-s.m.a,"IIg 'ittOUffice	4			-	-		162	24	'81	101			-		100	100	-		0.00	2"2
	Plant prep. & temp. Micels.					-		1 1	405	3 105	1 105	_		-		-	5-0	-	_	1-1	
Jot! º4	I) fillitir 's'illitar clean-up system		w:			-		63	14	109		_		7-8		14	(-)	100	_	191	1.4
2n 1 15	ff:N3HQ:Gorif. Cntrl Envips/fooling/etc	(2)	-	_		-	-	acua	W5	74/4/5	2.415	-	-	-		-	-	-	-	-	
	Produce da'fJoaillind!" & co'ddainnei's				_			e:	12	%	500		_		1-1	-	-			-	tı
1.4	Suprotal PenQO 3a Aet*(1) Costs	2	-	÷		9		6.t"% 7	1. <b>6</b> \$ti	ni 174	10 804	-	FO	-	-	-	-	-	-		72,7
Period 3a	Additional Costs																				
38.2 1	Site Cfujlac(tlezoliJCJn Survey				-		9	2 V27	IPI1	3.805	5 SijS		-	-		-	-		2	19 100	T.
J.a2	Suoto;al Pilloco Ja Kidifijomi Costs			-	=			2 927	8.7;8	3 905	380	-			-		-	-	-	15.100	7.8
Period 3a	Penod-Dependent Costs																				
3a.41	Italiani no				-	-		:78	103	1a5	306	_	-	-				-		-	,
Ju 42	Property taxes		-	-	-	-		G		,	r	-	-	10			-	-			
			401						100	502	Sinz										

That Seffit de, Inc.

Table D-1 Oconce Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

Activity		Decon	Removal	Packaging	Transport	Off-Site Processing	LLRW Disposal	Other	Total	Total	NRC Lic. Term.	Spent Fuel Management	Site Restoration	Processed Volume	Class A	Burial V	Class C	GTCC	Burial / Processed	Craft	Utility and Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet		Cu. Feet		Manhours	
Period 3a	Period-Dependent Costs (continued)																				
3=44	Heavy equipment rental	-	45%	-		-	-		69	526	326			-		-	-				
38.4.5	Disposal of DAW generated			9	-		35		7	45	45	-		-	514			-	10.287	19	
	Plant energy budget					-		1 334	199	1.522	1 527			-	-	-					
	NRC Fees		-					249	25	274	274		-	-	-	-		-			
	Indirect Overhead		-					1.548	232	1.780	1.780			-	~	-		-			
	Security Staff Cost							162	24	186	186			-							6 257
	Unitry Staff Cost							74.419	2 163	16.582	16.582			-							258 529
38.4	Subtotal Period 3a Period-Dependent Costs		859	9	7.		22	17.986	2 848	21.730	21,730		-	-	514				10.287	19	
3a 0	TOTAL PERIOD 3a COST		859	9	7		22		5 183	36.710	36 339		370		514				10 287	19 119	
PERIOD 3	3b - Decommissioning Preparations																				
	Oirect Decommissioning Activities																			f.	
	Vark Procedures									46.00			52.5								4.33
	Plant systems	-		-		-		433	65	498	448		50	-			-				4 793
	Reactor internals				-			229	34	263	263		14		(2)		-	-	-		2 500
	Remaining buildings	-	-		7.0		-	124	19	142	36		107		151		-			-	1 350
30.1.1.4	CRD cooling assembly				-		-	92	1.4	105	105	1.5	-			-					1.000
	CRD housings & ICI tubes	*	300		-			92	14	105	105		-			1-1	-				1 000
30 1.1.6	Incore instrumentation	*	100	*	-			92	14	105	105	180	-	-	(*)	( <b>-</b> )	-	-	100		1.000
30.1.1.7	Reactor vessel		1-0	×	-			332	50	382	382		-	-	000			-	3.00		3.630
38 1 1.8	Facility closeout			-	-	-		110	16	126	53	-	63								1 200
30.1.1.0	Missile shields		-		-			4.7	6	47	47			-	120	-		-			450
3b 1 1 10	Biological shield					-		1110	15	126	126					341		1-0	14.0		1 200
	Steam generators		100					421	63	484	484		-	140	-	040					4,600
	Reinforced concrete				-		-	9.7	7.4	705	53		53	- 4	541	-					1.000
	Main Turbine							143	21	164			164					-			1 590
	Main Congensers					-		143	21	154			164			-	-	-			1 560
	Auxiliary building						-	350	37	287	259		29	127	100	107	-	-	-		2 730
	Reactor building		-		-		-	250	37	287	259	-	29	-			-	-			2.730
36.1.1						-	-						658		-	-	-	-			
30 1 1	Utal			-	-		•	2-951	.443	3 394	2 736	-	658		-	17.					32 243
36.1	Subtotal Period 36 Activity Costs		•	-	5			2.951	443	3 394	2 736	2	658	-						-	32 243
	Collateral Costs																				
	Decan equipment	583		-		7	-10	-	132	1.016	1,016	8		-	-				-		
36.3.2	Pipe cutting equipment		1.000		-	* * * * * * * * * * * * * * * * * * * *	-	-	150	1 150	1,150	-	-	-				-			
36.3	Subtotal Period 3b Collateral Costs	583	1,000	-	*		. 4		282	2.166	2 166		•			-		*			
	Period-Dependent Costs																				
3b 4.1	Decon supplies	3.	~	-				-	7	34	34	-		1.5	1.0	-	-				100
	Insurance		×.		100		1.0	160	16	175	176		~	-	1-1	1.0			~	-	9.6
36 4.3	Property taxes		100			:*:		3	0	- 4	. 4		*	3.5	1.0			*		-	1 =
35.4.4	Health physics supplies		218		161		180		54	272	272				100				1.00		9.4
3b 4.5	Heavy equipment rental	-	.24						3.4	262	262			-			1-1				
35.46	Disposal of DAW generated		-	3	4		12		4	25	25			-	285				5.706	10	
3b 4.7	Plant energy budget			-		X.		660	9.9	759	759	-	140				-				
3b.4.8	NRC Fees							124	12	137	137			-						-	
3b 4.9	Indirect Dvernead		-		-	-		1.071	161	1.231	1 231		-			-	-	-	-		
	Security Staff Cost		-		-		-	81	12	93	93	_					-				3.120
	Utility Staff Cost			-	-	1-1		10 191	1.529	11 720	11.720	-			1 - V				-	-	178 880
36.4	Subtotal Period 3n Period-Dependent Cogts	7.7	44%		- 2			12.290	1 929	14 712	14.712			-	285				5.706	10	
					-									-				-			
36.0	TOTAL PERIOD 16 COST	912	1 4 46	3	4		14	15 241	2.654	20 271	19.613	-	653		285			*	5.706	10	214.243

Table D-1
Oconep NuclearStation - Unit 1
SAFSTOH Deconitationsing Cost Estinate (thousands of Mod dollars)

						Off-Site	LURNO			100	NRC	Spirnt Furil	S,fet	ProcessMd			/olulnBt		Burial!	Lecture	UtiliT/Y'incj
Activity	Activity Description	Decon C05't	Rotno\'al	P.3t:kt/@log Costs	Trat\Sport Costs	Proetrii-t.ing Cosil.	Ot'PO":HI	Official	TOtali Contingency	Totali Costs	Lle. Tetrn. Costs	Mon"gem,MI Costs	RetilOfallori CostS	VOlume CU.PHI	Clus A Cu Feel	Claus B Clu.FM1	Clian C Cu Fvol	GTeC Cu. Feet	Wt., Libe_	Ctil'I MSIlhou/s	Chnu;)@!.tof Manhours
PERIOD 3	3 TOFALS	9"0	23N	16	nı	-	34	45.871	7837	56 981	55,953		1.028		800				15:993	19.729	5.64 <b>?e</b> ]
peRIoD A	4a • Lugo COmponen'll Reril(bvAl																				
iTerll)(J.áa	D'extl Officiaments or all factivities																				
NQUI S	le;tn, Stu;rdf System Removal																				
4a 111	Reactor Clockant Piping	7!1	136	h:	7.	120	121		102	5.15	545	(+	-	<b>#53</b>	oj		-	- C	+ 1 1 =toff	1930	
4h.i t:2	plittos#/flobillef Riehel Tank	3	'0	1	J	23	23		11/2	79	7g		-	94	64	-	-		2:] eJlj	a13.5	
	Reactor Coolant Pumps & t,la'D.'S	19	£	120	237	1.15	1977		, 3	j 64li	3.048			374	7.504				∹:€i lil.4	3 S21	
	Pressurizer	6	.1?	324	5				1=1	to:34	1.993	100	-	-	• 147	-	•		HI" 604	1 796	•
	Steam Generators	75	1'4:1	fi"!'t	16,70		11,258		) -He	1eO'1	1f1G311	100			1 : to€	-	-		&10.rc	10.254	
	R>el11.rl \$1v'll' Ges'liliral,1 Un,h	-	-	571	760	-	• 1 286		3 003	15 -J2	15 72Z	100	· ·		12.866	-	151	-	1 810,770	5 4000	7\$0
	CRDMs/ICla/Service Structure Removal	24	73	235	41	31	1/24		511	660	;:e:(1			374	3.053	-			155)84	2221	-
	Reactor Vessel Internals	55	'e.i::	¥ 050	200 D	+1	official	159	4 562	14 55.4	J45-Sol	100			1.263	75 n	fili	150	Z!I4:14E	Reei	981
la 1 ' 9	Vessel & Internals GTL & Disposal	-	-	-		-	Q 749		'oil'):	11 212	11 212	180		-	-	-		4141)	79 646	-	
Ju 7"C	Reactor Widdel		:P32i-	>11	n	-	d one	199	e::2.3	16 241	18 234	1.61	-	-	0.862	257.3	785		=:t/3.:tY':;	<b>161</b> 883	
46.11	Totals	120	"8*4	5 12:1	2 2£J	313	THE BELL	317	20 154	83 'J:"8	e3978	1.		1,325	46 838	J. 3039	517	449	6.059, am	65 ;215	'2'S
	e;f Mar:lf Et1u,prnent																				
	Main Turbine/Generator	120	2/33	13	2.8	162	-		<u>5</u> 92	Hi).J	1434	(2)	-	4.020	(4)	-	-	-	341.722	6,563	-
48.1.3	Main Condensers	140	8C2	, t	h	3jSi		*	,92	1:33	17Ei	(14)	-	\$ 310		-	-	~	2'Ja 9:":	rJ;01	-
Cascading	Chatli ficin, Ellern Building Demoktion																				
35,11 It 1	Reactor Building		710			8	8	9	tCt3	815	H1;;	9		-	121	-	-	127	-	S.FT.	
4. 042	Auxiliary Building	170	92	1.5			-		2.4	105	105				(4)	-			(4)	; 333	
Ja 1 9 .:	[urDtnill BLJulling		182	0.5	-	-		-	27	209	2a-;,			-			-			jOF	9
B • 4.1	FlJelSu>iCh";	550	8	-	-	ž.	-	-	to	80	80	(5)	-				-	(7)		Y3"	8
ia 1 d	tams		HIS-!			•		-	158	1.211	1:\:		-	-				17,0	•	⊲n foo	- 1
","'U)C'lodl (	)/ Plant Systems																				
4.151	2"-A""lCal Addlotr.	1-1	27		-	500	-	-	.0	Z†	-	(-)	2h	-			1-1		-	821	45
4s 1 5,1	","email: AjdJition PLCA	1-1	112	0	1	20	100	-	79	5,	52	-		222		(*)		79.1	9,016	501	*
J1 15 1	Condensate	140	529	-	4.7		5-6		19	0:(13		-	609	-		-	10.0		·	t;55fo	-
Ail 1 5 I	f-onOltnUile /Con!:an1TiB[eQ,	-	526	39	Th	0 254	-	-	561	3,961	3 ,Sa;	-	-	10 383	0.00	-	5-6	-	1 JJ3 B::1	1; .185	3.6
4113	ConOll11ur Cl'ttJ <illing td="" water<=""><td>(2)</td><td>)JfI</td><td></td><td>-</td><td>-</td><td>4</td><td></td><td>51</td><td>Htg</td><td></td><td></td><td>1533</td><td>-</td><td>(-1</td><td>-</td><td>-</td><td>•</td><td></td><td>10.040</td><td></td></illing>	(2)	)JfI		-	-	4		51	Htg			1533	-	(-1	-	-	•		10.040	
lad': 6	Elildro Hydrifullo: Turbine Control	*	18	-	-		-			.0	-	12	21	7-1	-	-	-	-	-	499	
	Feedwater & Emergency Feedwater	~	-01	-	* 1	-	12	2	يانو	'el"	-	-	tB1	-	-	-	3-1	100		4.852	
4a 1 5 8	Feedwithof & emilifothC'( ".e/;wathtIIC"n:,		149		11	<b>G</b> 4:3	12	-	106		715	12	*	4813	-	-	121	1-1	1':f- 9Ud	3.753	
	Feedwater & Emergency Feedwater REA	-	n;		TO T	8T6	12	2	127	!2Q	.20	197	011	9 &15	-	120	140	141	195 580	5,531	-
	I-lealtl'O''', 1'5	-	Jq.	-		5	12	2	55	423		-	22:		-	127	141	141	15.0	"1001	
	P'ie/attlfrfDl."ICon;,q-InitilG:J.		;5-0	7	13	4-1	(+)	-	14.)	ifD7	≥<)7	100	*	5:419	121	*	9	-	22Otl-:/olo	6.466	
	"Italt/Veo;1		31	-	-		-	3	5	is	-		36	-	•	-		-		† rm	-
	High Phyliulifi Extraction	175	24				.5		4	21	-	-	2,7	-	1	-	93	-	100	72:50	
	HadUlutiC Off	(4)	2	-	-	-	-		0	J	-	170	3		-	-	170			"S	
	"iyllrO(t6fl	(*)	28	1.5			-	-		31		100	30	-	100	17.5	151	*	-	(OIH	
	Hydrogen Sui 011	-	.0		-		*		0	3-4	-	2.E.	38	*	1.5	15.0	151	17.4		923	8
	L¢HPttuufe Extraction	-	36		-	-	-		3	41	-	2.5	41		(*)		-	-	151	1 096	-
	Main Slum	-	81	-	-				13	81	-		99		150	-	100		15	2 558	
	∖Aaldi Slaum Fl∷#	300	310.0	37	(6	2,530		-	169	14006	1.41)6	1-1		2' 80il	-	77.0			112:9;284	7159)	-,
	MOISture Separator Reheater Drains	7.07	6	C	D	Œ	-	-	2	14	14	3-6	-	H:			1-1	1.5	2 520;	143	
	Post Acadent RIOTIOnivil	1941	29	16		27	-	-	1)	M	ao	3=3		₹01				-	16304	713	-
	Relettell Build IIQ Spray	-	86	3	5	'0-	-	-	!2	))0	SJ9	-	(*)	2.105		-			a5 46ol	2 150	-
	Sample MontletrTng	-	49	7	'0	46	61	-	<9	270	270	-	-	189	SIE,		-		97 8:-CI	2'!N	-
	Stator Co.3aot		19	-	=	-	-	-	7	6.0	-	140	Eiß-	-			~	-	1-	"Z17	-
Me 1 5 25	Silentm OraM	120	91	12		-	-	-	12	9)	1.4	100	93		-	-	(4)		-	2.668 • 74 <b>a</b>	-
	Steam Seal		3.55			'e			H	"8	1:e.			n::					21 549		

Table D-1 Oconee Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	olumes		Burial /		Utility and
Activity Index	Activity Description	Decon	Removal Cost	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	Other	Total Contingency	Total Costs	Lic. Term, Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt. Lbs.	Craft Manhours	Contracto Manhours
Osposal d	of Plant Systems (continued)																				
	Turbine Oil	7.1	121					-	16	139	-	-	139		-			*		3.518	
4a 1.5.28	Vacuum	*	714					-	17	131		-	131	-			*			3.438	
4a 1.5	Totals	-	3 804	107	190	7 015	51		1 853	13.031	10.682		2 349	77 114	312	-			3 159 660	105 638	,
4a.16	Scaffolding in support of decommissioning		393	8	-2	44	5		107	559	559	1,000		433	27				21.916	12 302	
4a.1	Subtotal Period 4a Activity Costs	160	14 190	€ 303	2 496	8 672	47 041	317	22 766	107 946	99,597		2 349	88 202	47 177	3.325	517	440	9.821,414	225 231	3.275
Period 4a	Collateral Costs																				
4a 3 1	Process liquid waste	19		8	75		38		23	113	113	-	-	-	144		*	100	8 653	28	
4a32	Small tool allowance	~	161		-	949	141		24	185	167		19	-	-						
4a.3.3	Survey and Release of Scrap Metal	-			90	12		329		379	379		£	-		-	2				
4a 3	Subtotal Period 4a Collateral Costs	18	161	9	25		38	329	97	677	658		19	-	1-4-4	-	-		8.653	28	*
Penod 4a	Period-Dependent Costs																				
4a 4 1	Decon supplies	61	-	-				4	15	.77	7.7	-		-			8	-		-	*
42.42	Insurance	-	-	-	-			364		401	401		- 1		8			-		-	
4a.4.3	Property taxes	-						- 7			7		1	-			-	-			-
4144	Health physics supplies	-	1-463		-				366	1 829	1.829				-	-	-	-		-	,
48.4.5	Heavy equipment rental	-	2.501	-					375	2.876	2.875		*			-		*		-	7
4a 4.5	Disposal of DAW generated	-		51	-43		127		43	265	265		-	-	3 022	-	2.5	-	60,442	10	
4a.4.7	Plant energy budget	100			-		-	1.430	214	1 544	1 644		-	-	-				-		
4a.48	NRC Fees	-	-		-			TAB	75	823	623		-		-		•		-		
48.4.9	Liquid Radwaste Processing Equipment/Services	-		1-1				426	64	490	490				-	-					
48.4.10	Indirect Overhead	1.5			-			2.598		2.988	2.988	-	-		-	-	-	-	-		
48.4 11	Security Staff Cost		-		-			651	98	749	749	(*)	-	<b>&gt;</b> €0			-	-			25.493
48.4.12	Utility Staff Cost	-	-	-	-			24 584		28.386	28.386	-					-	-	and the		433,97
da 4	Subtotal Period 4a Period-Dependent Costs	51	3 965	51	4.3		127	30 909	5.380	40.537	40 536	-	1	-	3.022				60 442	110	459.464
48.0	TOTAL PERIOD 4s COST	239	18 315	6 363	2.564	3.670	47 206	31 555	28 243	143 159	140.791		2,368	88,202	50,344	3 325	517	440	9 890 509	225 369	462 735
PERIOD 4	4b - Site Decontamination																				
Penori 4ti	Direct Decommissioning Activities																				
	Remove spent fuel racks	278	32	122	58		479		289	1.269	1 269			-	⊋ 450	*	-	-	219.804	956	-
Disposal	of Plant Systems																				
4b 1.2 1	Component Cooling		4.7						7	54		-	54	-			3			1 374	
4p 122	Component Cooling RCA	121	116	2	3	130		- 8	45	300	300	-		1,430		-	-		58 079	2.674	
46.123	Care Flood		97	3	1	192		- 6	5.4	351	351.	-		2.110					65 669	2.358	
40 1.2 4	Electrical (Clean)	1.5	883	3.5	4-				87	670	*	-	670		-	-	9			16 347	
			169	3	H.	7,43	6		67	394	394	-	-	1 571	42	-	-		67 569	4,111	
40 1 2 6	Electrical (Contaminated) RCA		1.194	39					513		3.143	-	-	15 179				-	616,410	28 392	
	High Pressure Injection	-	781	110			745		765	4.885	4.885			25,429	3,612		-		1,374,364	19 605	
	Incore Instrumentation		15	0	.01				4	22	22		-	100	13				1.168	406	
46129	Line Pressure Injection		456	35	25	753	250		301	1.850	1.850			8 280	1,314				450 790	11 500	
	Qn-StelOff-Site Pover		94			•			1.4	108	2	-	108		-			*		2.517	
46 12 11			149	7	11			*	106	712	712		-	4.842	-	-	-		196 641	3 591	
	RFS Refueling Water	•	40	- 1	1	51			10	111	111		-	562		(*)		*	22,826	929	
	Radiation Instrument Alarm	-	11	-	1	-		-	2	13		-	13	-	*				-	323	
	Radiation Instrument Alarm RCA	2	-29	.0	.0	0				42	42			63	-		*		2.565	7.95	
	Reactor Building Cooling		345	28			3		351	2.471	:.P!	-		18.745	-		*	*	761 247	8 761	
	Reactor Coplant		206	11					n	508	5;)8	-	-	793	55.)	-			?H'H!.6	5.353	
	Reactor Coolant Storage		440	40			1!t		200	:,,,3,,,,	1 457		-	St.Bailt	1.804		2		302 444	10.919	
4b 10 18	Spent Fuel Cooling		216	16	25	736	135		128 26		HE		-	2 592	597	-	-		16'9(J9Ci	5.349	
	Ventilation (Clean)		172							'95			198							5 :i"e	

Table D-1 Oconec Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed	-	Burial V	olumes	_	Burtal /		Utility and
Activity	Activity Description	Decon	Removal	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	Other	Total Contingency	Total Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C	GTCC Cu Feet	Processed Wt. Lbs.	Craft Manhours	Contractor Manhours
			0031			0.0010			o dilanguist,												111111111111111111111111111111111111111
	of Plant Systems (continued) Ventilation (Contaminated)		516	12	44	653			262	1.655	1 665			9 382					381 013	11 488	
	Ventilation (clean) RCA		242	14	12	448	- 2	į	130	838	836		-	4 925					200 000	4.619	
	Totals	12	5.923	298	485	9.068	1.567		3 240	20 551	19 507	-	1.044	89 682	8.234	-			4 766 747	146.701	
4613	Scattoking in support of decommissioning		590	12	3	58	8		161	839	839	œ.	-	650	40			-	32 874	18.454	
Decontain	nination of Site Buildings																				
	Reactor Building	815	667	175	254	424	9.87	15	860	3 995	3.998		-	4 558	10 211			-	894 566	31 331	
	Auxiliary Building	272	34	25	3.5	57	53	-	169	727	727	-	-	629	1 439		-		124 416	8.853	-
	Turbine Building	202	21	51	8		11		111	357	357	1.5	-		314		(8)	(5)	21 708	5 669	
4b 1 4 4	Fuel Building	176	191	4.	5	83			152	659	619	100		916	128		(2)		46.231	8.672	
45.1.4	Totals	1 325	973	205	304	564	1 020	-	1,311	5 702	5 702	(**)	-	E 202	12 092		(#)	(5)	1 086 921	54 526	-
45.1	Subtotal Period 4b Activity Costs	1,503	7.518	637	830	9 657	3 077		5,002	28 361	27,317	-	1,044	106 534	22.817				8 105,346	220 636	-
Penod 4b	Additional Costs																				
4b.2.1	Containment Paint Remediation	92		7	12	-	84	16	69	264	264	(*)	*:	-	452	100			(=)	800	
4b.2.2	License Termination Survey Management Program.							616	185	801	601		-		-	(=)	(4)		-	-	6.240
4b.2	Subtotal Period 4b Additional Costs	92	-	7	12	¥	84	516	254	1.065	1 065	-	-	(2)	432	-		140		800	6.240
Penod 4b	Collateral Costs																				
4b.3 1	Process liquid waste	49		23	68	2	101	-	62	304	304	(4)			389	-		121	23.320	76	
40,3.2	Small tool allowance		158		-	- 2		-	24	181	181				-		-	-			-
4b.3.3	Decommissioning Equipment Disposition		-	109	29	605	73	-	124	940	940		-	6,000	373	-	-		303 507	88	
4b.3.4	Survey and Release of Scrap Metal		-		-			494	7.4	568	568			-	-	-	151				-
45.3	Subtotal Period 4b Collateral Costs	49	158	132	98	605	174	494	264	1.994	1,994	170		6,000	762		(2)		326.826	164	•
Period 4b	Period-Dependent Costs																				
4b,41	Decon supplies	738				*	-		184	922	922	100	-1	-		1.0	100			167	-
40.4.2	Insurance	-	-	-		-	-	413	41	454	454	-		-	-				1.40	-	-
4b.4.3	Property taxes		-		+1	-	-	9	1	9	8	-	**			141	-			-	
4h.4.4	Health physics supplies		1 459	-		-	-		365	1.824	1.824	1.0	-		-		-	*	7-3	1-1	-
4b, 4.5	Heavy equipment rental	-	2.813			-	-		422	3 234	3.234	1=		7-3			2-7		-	1.0	-
40,4,6	Disposal of DAW generated		-	57	48	-	143	*	49	298	296	720	**	-	3.399	1-1			67.981	124	-
4b,4.7	Plant energy budget	-	~	-	-	-		1.278	192	1 470	1 470		-	- 1		100		(2)			7
45.4.8	NRC Fees	12	-	-	-	2	-	847	85	932	932	(2)	-		-	101	-				-
4b.4.9	Liquid Radwaste Processing Equipment/Services		=		-	8		483	72	555	555	1020	*	-	-	121	-	-	-	-	
4b,4 10	Indirect Overhead	*	=	•	-	*		1 994	299	2.293	2.293	12		-	( <u>1</u> )		-	-	-		20.024
	Security Staff Cost	*	-		~			738	111	848	848			-		-	-	-		-	28 871 333 029
4b.4 12 4b.4	Utility Staff Cost Subtotal Period 4b Period-Dependent Costs	738	4.272	57	48		143	18 453	2.768 4.589	21,221	21 221 34 061			-	3.399				67.981	124	
40 0	TOTAL PERIOD 45 COST	2 482	11 947	834	988	10 302	3,474	25 325	10,129	65,481	64,438		.1.044	112,534	27.430	*			5 501 153	221 723	368.140
PERIOD 4	d - Delay before License Termination																				
Penod 4d	Direct Decommissioning Activities																				
Paneri Ju	Period-Dependent Costs																				
	Ineurance																				-
	Property taxes	-				-		15	2	17	17			15						-	-
44 4 3	Health physics supplies		193	-	į.	-		-	45	242	242		-	(=)	-				-	-	-
45.4.4	Cisposal of DAW generated	-	- 30	ä		2	10	į.	3	20	20	-	-	-	233	-		-	4 659	9	_
				-	_ 4	-			-					-							-
4d 4.5																					
4d 4.5 4d 4.5	Plant energy budget NRC Fees				2			426	43	469	469	(=)	-	-	343	1-0		140	529	141	

Table D-1 Oconee Nuclear Station - Unit 1 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

**********		P. Control		D		Off-Sile	LLRW	- CH	Warnel	T - 1 - 1	NRC	Spent Fuel	Site	Processed	Class N		Class C	GTCC	Burial /	0	Utility and Contractor
Activity Index	Activity Description	Cost	Removal Cost	Costs	Costs	Processing Costs	Disposal Costs	Other Costs	Total Contingency	Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Cu. Feet		Wt., Lbs.	Craft Manhours	
Penod 4d	Period-Department Casts (continued)																				
Ad A E	Security Staff Cost		-	-	*		-	6		. 7	7			-	-			•			14.63
40 4 9	Utility Staff Cost		Section	1.5				1,661	249	1 910	1.910	-	-						. 5	, i	34 13
44.4	Subtotal Period 4d Period-Dependent Costs		193	4	3		10	2.313	377	2 900	2.900			*	233	-			4 659	8	48.74
44.0	TOTAL PERIOD 46 COST		193	4	3		13	2.313	377	2,900	2 900	:=	-		233	*			4 659	8	48 74
PERIOD .	4e - License Termination																				
Penod 4e	Direct Decommissioning Activities																				
ãe 1.1	ORISE confirmatory survey		*	-	-	-		150	45	195	195	18		1.5	557						-
46.12	Terminate license																				
4e 1	Suptotal Period 4e Activity Costs					-		150	45	195	195			1-1	3.4						
	Additional Costs																				
4e.21	License Termination Survey		-	-	-		2	3 445		T 078	7 078		-	7.			-			135 747	3.12
4e-2	Subtotal Period 4e Additional Costs					-		5.445	1 633	7.078	7.078					4				135 747	3.1
	Period-Dependent Costs																				
4e.4.1	Insurance						-		*					-	-	-			-	-	-
An 4.2	Property taxes							5			5			-	-				-		-
4e.4.3	Health physics supplies		835		* .		-		209	1.043	1.043	-	-			-	-	-			-
TILL	Disposal of DAW generated		*	5	4		13			27	27		-		314	-		-	6.27€	11	-
4111 A f.	Plant energy budget	*						199		229	229	-	-	•	•	-	-			9	-
48.45	NRC Fees	*			*			530		583	583			-			-				
48.47	Indirect Overhead							412		474	474										
4# 4.8	Security Staff Cost	4			-		-	121		140	140		-	-		-					4.59
At 4.3	Utility Staff Cost					-		A 045		4,652	4.652			-			-	-		-	68.85
41	Sutratal Period 4e Period-Dependent Costs		835	£	4		* 3	5.312	963	7 153	7 153			-	514				8.27€	11	73 58
Ag Q	TOTAL PERIOD 4e COST		835	Ξ.	4		13	19.907	2.662	14,400	14,426	-	-		314				6 276	135.758	76:70
PERIOD	4 TOTALS	2.721	31 391	7.206	3 560	18 974	50 704	70 100	41.410	225 966	222,555		3.412	200.736	78 320	1.325	517	440	t6 402 600	582 859	956-33
PERIOD	5b - Site Restoration																				
Period 5t	Direct Decommissioning Activities																				
	of Remaining Site Buildings																				
	Reactor Building		4.114				2		617	4.731		5	4:731						-	53 465	
	Auxiliary Building		826			-		-	124	950			950	-	-	-	100	100		12 013	
	Turbine Building		1 762						264	2.026			2 026							31 130	
	Turbine Pedestal		262		-		-		39	301			301					- 5		3.192	
	Fuel Building	2	648		-		-		97	745			745	-	-		-	-	-	9 163	
5.to. 1 1			T.611						1.142	8 753		1	8 753							108 963	
Site Close	ead Advites																				
56 1.2	Grade & landscape site		112	_		_			17	129			129				2	22		250	
5b.1.3	Final report to NRC			-				143		164	164	100					-				1.5
56.1	Subtotal Period 5b Activity Costs		7.723			-		143		9.046	164		6.682				-			109 213	
Period 5t	Additional Costs																				
5b.2.1	Concrete Clushing	1.6	270					2	41	313			313					18.0		1.376	
5b.2	Subtotal Period 5b Additional Costs		270		7 <b>=</b> 7	100	1-1	2		313		-	313	-	-	3.0		100		1 376	
Period 5b	Collateral Costs																				
5b.3.1	Small tool allowance		7.9		-		-	-	12	91		-	91		-						

Tahlie I)-1 Ocunce Nucle ar Station - Unit I SAFSTOIR Decommissioning Cost Estimate (humanids of 2008 dollars)

						Off-Site:	LLRW				NRC	Spent Fuel	Site	Processed		Bultital \	/olumes		Burial /		Utility and
Acu'lly Index	Act;iyjt; OeliCflD0On	Decem COSI	Remotatal Cot.t	P.ek3tJlng cos-tii	St <b>mspoll</b> Costs	P,oceustna Crasslet	Diap05s:itil Costa	Other Coata.	Total Clantingency	Tot⊳! Costs	Lic, Tmm, Costi	M3flitgement Collis	Relitibilation Cosits	Volume CU. Fee1	Class A Cu. Feet	Class B Cu.fillet	Cliks C Cu. First	G166 Cu. F0(II	Processed Wt., Lbs.	Craft Manhours	Contractor Manhours
5111	Sumt>tal Pencd Sb Collateral Costs	-	79	3.51		-		2	12	Sı		2	91	*				÷			-
PtrtOd 5ltl	PillOd:Oul:\'endCl'nt Cott\.																				
3tJ 4 T	In'II,JI'te.t'		*	10	-				-	•		1.0							-		2.51
5D J 2	P1Dper1'r UtirM	(*)		(*)				15	3	17			17				-	-			1.51
5b.4.3	Military equipment rtiff(t)		6 726	1.0	-		-		: 0'9	Te-;1			7511				-		1.5	-	100
5b 4 4	Plant dineroy buogist		-		-	-		jC:-	J6	)≥.)		186	35"		-		-	-		-	-
jD.ItO	IrrQ'fK: Oo'lirne;)d	140	-	-			1-	"TE9	111	e501	bc.J	180	-	-							
3645	Security Staff Cost		-			-	14	lijJ	24	1&(		(-1)	184		-	-	- 1	-	1-0	-	1j,Q5
.5D.ol -	Ulfirty Sial' Coxl		-		-	-	-	6 es	1 03.2	7 9:21	140	-	7 821			(=1	9.5				1,21 420
दर्ध व	Sultitotal Period 30s Period-Dependent Costs	125	f 7fig	:=	*			8 109	2.234	1:\15	ISO	~	115, 285		**	•	-	-	(4)	-	129 47
tr.C	tOTALPERIOQSb-CQSV,	*	28 <b>a</b> 5.4	Tax	*	8		8 25}	1 467	26.584	;au	-	25 570		-		-	-	*	1 tJ 589	131 00
PERIOD 5	TOTALS		14!664		4	=	-	8 253	;) #57	26.584	) O'e		25 570			**		-	*	I'L- 59	131 03
rOlal Co	257 r:)OECOM!,USS,Ot,	t.:E8g	57 928	7;.o:t1	4.1:17	ie! 974	E.i '6";)	::\$0:1L16B	90 689	5£>56ï5	500 se;	64.675	20n.";	200 736	tisa goat	B.325	siri	440	17 2 <b>%.</b> 340	804 151	1 631 551

TOTAL COST TO DECOMMISSION WITH 17,MW CONTINGENCY.	\$595.675	thouunds of	2008	dollars
TOTAL NRC LICEINSE TERMINATION COST IS 84,1% OR:	\$5,500(i,e)	thous.=nd& at	2008	dollars
SPENT FUELL MANAGEMENT COST IS 10-98% OR,	\$64,675	flv;mt;Jil1(l1 Cif	20Qi	If.Ollars
NON-NUCLEAR DEMOLITION COST IS 5,044% OR	SJO,011	thousands at	2008	dollars
OTAL LOWHENEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC)	130,745	eubl@ f0(eft		
OTALGREATER THAN CLASS C RADWASTE VOLUME GENERATED	440	cuttic foot		
OTAL SCRAP METAL REMOVED	-0,t39	tom;		
OTALCRAFT LABOR REQUIREMENTS;	785,051	m,In-hOur\$		

C'd Notes

nji - indicates that tt4 lidt\d. Wit charged his decommissioning expense

a - intocetts that that Littlin's partnermed by decommissioning disd

i - indicates that this Dable is less titlin 0.5 teditir n/ill littlin

i - cell confaming • indicates disarcovalue.

Table D-2 Oconce Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				tIRe	Spent Fuel	Sittel	Processed		Bufuil \	/olumes		BUII;ali		UltMy.oo:
Accetility Introx	AChy'lly Öt'Cefil'itiQn	Oet.off CO#1	Removal	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	CO tillo	iculul Contl/IqQnCy	Con!	Lie. 'elm, Cosu.	Management Costs	Restoration Costs	Volume Cu. Feet	CLSU A Cu. Feel	Clian B Cu. Filt		Glee Cu. Feet	Processed WL, Lbrs.	Crodt Manhours	Contractor Manhouu
PERIOD 1	0 - ShulOO'wn IhloughTfoIn;htle>n																				
P.II:ba ta	O'Ccl gecomm,-s.,orr o Activities																				
10.1t	SAFSTOR site characterization survey							381	114	495	.9"				2					•	
	Prepare preliminary decommissioning cost	-			5	14	-	38	5	43	42			-		3		*			558
	Notification of Cessation of Operations									2											
	Remove fuel & source material									nta											
	Notification of Permanent Detueling									B											
	Deactivate plant systems & process waste							200	-	具	- 1										400
	Prepare and submit PSDAR			47				58	9	67	ş1	127	-	7.0	100						11/Se.
	Review plant dwgs & specs	3.4			-			38	6	43	40			-	-	-	-	-			556
	Perform detailed rad survey Estimate by-product inventory							29	4	33	13										428
	End product destriction						-	29	4	33	93	-	-	-		-	-	-			428
	Detailed by-product inventory	-	-	-		-	-	43	7	50	50				-	-	-	-			842
	Define maior work sequence							29	4	33	33										426
	Perform SER and EA							90	13	103	103					- 0					1 327
	Perform Site-Specific Cost Study				-		-	145	22	166	14	181		-	-		-	-			2 140
Actory ap	Cit.c.alCirc																				
	P,eD,, pl3!Tl.oo tacabes (ci ;;.t.FZiu,,"				2	2	-	142	21	164	204			-	-	8	8				2.106
	tunt sysamma				-	-	8	121	18	139	139			-		3		2			t *5
	Plant structures and <b>Buildings</b>				-	2		90	1.4	104	10:4	-		-	-						1.335
	i(/M/e management		2		-	-	*	55		67	67			-	-	-			*		856
	s=aclirt, sint bite dormancy		-	-	-	8		58		6.7	67	-		-	-		-	-	9		'GI;
A 1,16	r otul				-			469	70	539	539	*	3	-	-						6 936
	onk r̂,O<±NoHb										100										
	Plant systems		-			-		34		39	39	170	20	-		-	-			*	506
	F. :-{Iry doslKlU: å dcrm.a"("r							35		40	49	(2)	20	-	100	-	-			*	51<
104 17	(cta)						*	69	10	75	79					-	-				1.020
	P,IXU e. catiot, 'jryng.,t,'are		2	0.00		-		3	5	3	3	1-		(*)	(*)	• :					a <b>y</b>
	Drain/de-energize f'On-conf systems									3											
	Oratustis-desistis S																				
	Draintidee'wl.:/t- cehl.:rriinij/eu ;'(,'elM									.0											
1a 1 22 3a 1	Deconsecure sor lam,nillPd systems Subtotal Period 1a Autrilly CCHtr	-	×	-	-	-	-	1.410	270	1,689	1689			(4)	(-1	-		-			"53"
;crio(i 1.	Additional Cods																				
182.1	Asbestos Remediation		2.759	7	283		2 164		1.273	6.461	5,481		197	-	25 455		~		J.1:Hn 5	.)\$15	-
10 =	SUbfafoil Period 14 Additional Costs		2 759	1	283	-	2.184		1.273	6.481	5.481	*		-	25 455		-	-	33091	35.451	
	Colleteral Costs																				
	Small tool allowance	-	15			2	-		6	48	46		-	-	-	-	-				
	Spent Fuel Capital and Transim	-	1			-		095	104	800	* 72	oro	-	-				3			
18.3	Subtotal Period 1a Collateral Costs		42	*	-	-		595	111	848	4,-	t100			•	-					(*)
	PenCG-j:loPtf\4UvP [:"/1/							7776	940	000	65.4										
1,A.3 1	Property, rilieli	-						1.386	130	1524	552 1.524	-			16						150
	Health physics supplies	-	586			-		1.386	147	733	731			1.0	100						
10.55	heavy *qu'Cit-e*t i-Cff.if	-	458						69	526	520				151				-	-	1-1
11.4.5	Disposal of DAW perer illery	-	400	10			24		6	50	5C	-	-		521				55.63		
MULTIE	Plant r-na'p, unuget			- 10				1:324	199	1,522	*** 2'			-	3.71				-		
	NRC Fees							471	47	518	518			-					-		
18.4	TVPS L. P. BIES.			-	*	-	-	471	47	275	518			(4)				-	-		0

Table D-2 Oconce Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed			/olumes		Burral /		Utility and
Activity	Activity Description	Decon Cost	Removal	Packaging Costs	Transport	Processing Costs	Disposal	Costs	Total	Total	Lic. Term. Costs	Management Costs	Restoration	Volume Cu. Feet	Class A Cu. Feet	Class B	Class C Cu. Feet	GTCC Cu Feet	Processed Wt. Lbs.	Craft	Contractor
maex	Activity Description	0031	0031	COSIN	50310	0.0313	0.0013	2000	Contingency	COStS	00315	COSIS	COSTS	Gu. Feet	54, ree!	GM. FOOT	Su. reet	54.1901	VIL. LDS.	mannours.	Mannours
	Period-Dependent Costs (continued)							221				202									
1a.4.8	Emergency Planning Fees		-		100	20	-	281	28	309	*	309	-	-	-	-	-	-	-	-	-
1a,4.9	FEMA Fees		-	-	-			126		145	145	The state of			-				: -	-	
1a 4.10	Spent Fuel Pool Q&M		-			*		745	112	857		857	:-:		-		-		:-	-	
1a.4.11	Indirect Overhead		-	-	14.0	-		2.135	320	2.455	2.455		-		-				58		
1a 4 12	Security Staff Cost		-	-	-		-	1 189	178	1,368	1 368				-						46.67
1a.4.13	Litility Staff Cost			-	-			19 239	2 888	22.125	22 125				-	-		-			356.65
1a.4	Subtotal Period 1a Period-Dependent Costs		1 044	10	8	•	24	27,671	4.228	32,985	31.819	1 166	100	~	571		1.0		11.419	21	
1a.0	TOTAL PERIOD 19 COST		3 845	11	291	-	2 158	29 786	5.882	42,003	40.037	1 966			26.026		-		342 334	35 472	418.696
PERIOD 1	1b - SAFSTOR Limited DECON Activities																				
Period 1b	Direct Decommissioning Activities																				
Decontur	mnation of Site Buildings																				
	Reactor Building	759		-					379	1.138	1 138									19 093	
	Auxiliary Building	297				25			148	445	445				-	-	-	-		7 865	
	Turbine Building	204			-	•	-		102	305	305			-				-			
	Fuel Building	201			-							-		-		-	•	-		5.402	
				-	-	-	-		100	301	301		-	-			(*)	-	0.00	4 427	-
10.1.1	Totals	1 460					*		730	2.190	2 190	-		-		-		-		DE 787	
1bi 1	Subtotal Period 16 Activity Costs	1 460			-	~	-	*	730	2 190	2.190		-	-	-	(*)			-	36 787	-
Peripo 1p	Additional Costs																				
10.2.1	Spent Fuel Pool Isolation	140		40			-	4.704	706	≤ 409	5 409	-	-	-							2
16.2	Subtotal Period 10 Additional Costs	147						4,704	106	5 409	5 409	-	-	-				-			
Penng 1h	Collateral Costs																				
10.3.1	Decon equipment	663							132	1016	1 016	12			-	-	-	-	-		
Tb.3.2	Process liquid waste	97		39	117		172		113	538	538				551			-	39 678	129	
16.3.3	Small tool allowance		26		200		11.4		4	30	30				-				-		
1b.3.4	Spent Fuel Capital and Transfer						-	87	13	100		. 30	-	-	-	-					-
1b.3	Subtotal Period To Collateral Costs	980		39	11=		172	87	262	1.683	1 583	100	-		361				39 678	129	
Daniel In	Period-Dependent Costs																				
10.4.1	Decon supplies	678							170	848	848										
tp.4.2		0.0											-		-	-				-	
	Insurance							195	20	215	215					-	-	-		-	
1043	Property taxes		1				-	342	34	376	376		-	-	-	-	-			-	
1b.4.4	Health physics supplies	-	267		-	-			57	334	234		-	/-/	-	-	-			-	
10.4.5	Heavy equipment rental	*	115			-	-	-	17	133	133		-	~						To a	
1b.4.6	Disposal of DAW generated			9	8	-	23		B	47	47	(4)	14.5	-	539	-	-		10.771	20:	
16.4.7	Plant energy budget		-		-			334	50	384	384	-	-	-	-	-	-		-	-	-
1b.48	NRC Fees	-		-	-	-	-	119	12	131	131			-		-	-			-	2
1b.4.9	Emergency Planning Fees		-		-	4	-	7.1	.7	78		78	41	40	-		-		-	-	
10.4.10	FEMA Fees			140	2			32	5	37	37	-	8	-	-	-		-	-		
10 4 11	Spent Fuel Foot O&M			-	9		-	1.88	28	216		216	4		-		-		-		
10.4.12	Indirect Overhead		2		2		2	538	81	619	619			-	-		-				
16.4.13	Security Staff Cost				2			300	45	345	345							-			11.765
	Utility Staff Cost	-				2	-	4 849	727	5.577	5 577										89,897
164	Subtotal Period 1b Period-Dependent Costs	678	382	- 9	8		23	6.967	1270	9.337	9.043	294			539		-		10 771	20	101 663
1b.0	TOTAL PERIOD 15 COST	3.118	408	48	124		195	11 758	2 968	18:619	18.225	394			1.200				50 449	36 935	101.663

Table D-2 Oconee Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

Off-Site LLRW NRC Spent Fuel Site Processed Burial Volu																10. 1.1.1					
Activity		Decon	Removal	Packaging	Transport		Disposal	Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Burial / Processed	Craft	Utility and Contractor
Index	Activity Description	Cost	Cost	Casts	Eosts	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu Feet		Cu. Feet			Wi., Lbs.	Manhours	
PERIOD 1	c - Preparations for SAFSTOR Dormancy																				
Period 1c	Direct Decommissioning Activities																				
1c.1.1	Prepare support equipment for storage		388		121	121			56	446	446		1.5							3 000	
	Install containment pressure equal, lines	-	32		-				. 5	36	36	,		-			2.00			700	
16.1.3	Interim survey prior to dormancy	4	-		200			733	220	953	953	( <del>-</del> ()	180	-						14 101	
10.1.4	Secure building accesses									H											
10.1.5	Prepare & submit interim report							17.	3	19	19		-	-		*					250
1c.1	Subtotal Period 1c Activity Costs		420	~	1-1	141		756	285	1,455	1,455	~	-		-			*		17 801	250
Period 1c	Collateral Costs																				
16.3.1	Process liquid waste	115		47	140		206		135	645	645	-	-		793	-	12	-	47.568	155	-
12.3.2	Small tool allowance		3			-			0	4	4			-	-		-				
10.3.3	Spent Fuel Capital and Transfer				-	-		76	17	87		67		-		-	-				2
1c 3	Subtotal Period 1c Collateral Costs	116	3	47	140	-	206	75	147	735	548	87			793				47 568	155	
Penoa 1c	Period-Dependent Costs																				
10.4.1	Insurance	*		-	151	-		195	20	215	215				-		-		2	1.5	
10.4.2	Property taxes	-					-	233	23	257	257										
10.4.3	Health physics supplies		186		-				47	233	233					-					
16.4.4	Heavy equipment rental		115		1.5			-	17	133	133	-	-			-	-	100		1.0	-
10.4.5	Disposal of DAW generated			2	2		6		2	13	13			-	144			100	2.678	5	
1c 4 E	Plant energy budget		-	-			-	334	50	384	384										
10.4.7	NRC Fees			100			(*)	119	12	131	131										
15.4.8	Emergency Planning Fees		-		-			7.1	7	78		78.									
1c.4.5	FEMA Fees					-		32	5	37	37			-	-	-				-	
16.4.10	Spent Fuel Pool O&M			(4)			140	195	28	216		215		-	-					74	
1c 4 11	Indirect Overhead				-		140	538	81	619	619			-			-			1.0	
14.12	Security Staff Cost						1940	300	45	345	345			40	-		2				11 765
10.4.13	Utility Staff Cost	4.		141	2	2	-	4.849	127	5.577	5,577		2				2	12			89 897
1c 4	Subtotal Period 1c Period-Dependent Costs		301	2	2		6	5.859	1.054	∄ 235	7 941	294		-	144		-		2 878	5	
10.0	TOTAL PERIOD to COST	116	724	49	142		215	7 584	1.496	10 425	10.044	381			937				50 446	17 96 1	101 912
PERIOD 1	TOTALS	3.235	4 977	198	557	*	2.595	49.228	10 347	71.047	68 307	2.740			28 163				443 230	90 368	622.271
PERIOD 2	ta - SAFSTOR Dormancy with Wet Spent Fuel St	torage																			
Famori Sa	Direct Decommissioning Activities																				
2a 1.1	Quarterly Inspection									.0											
24.1.2	Sem-annual environmental survey									a											
2a 1.3	Prepaie reports																				
2a 1.4	Estuminous roof replacement							230	34	264	264	_	_						-	_	
2a 15	Maintenance supplies				-			1287	327	1.608	1.608		-		-						-
28.1	Subtotal Period 2a Activity Costs				-			1 516	356	1,672	1.872										-
Penod 2a	Collateral Costs																				
2a31	Spent Fuel Capital and Transfer		_		_			3.215	482	3 697		3 697									
2a.3	Subtotal Period 2p Collateral Costs							3.215	482	3,697	-	3 697		-	-						
Period 2a	Period-Dependent Costs																				
	Insurance					-		3.279	328	3 607	3 132	475									-
2a 4.2	Property laxes							3 961	396	4 357	73	4 284									-
	realth physics supplies		549		-				237	1.167	1:187			-						-	
	Oisposal of DAW generated			2^	57		165		57	350	350			140	3 301				79.81	145	
	The state of the s				15					40.00	14.60		-		0.00		-			143	

TLG.SertHTSl.Inc.

Table D-2 Oconee Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						OffSUc	ILRW				NRC	Spent Fuel	Site	P,ocened		Burial	Volumes		Buriall'	10000000	Uhlin-JanKrd
Activity		Ooc-on	F(IfTiown)	Packaging		Proceulng		Other	Total		Lle, tellin	hunagemen;	Restoration	Volume	Clas A	ClituB		G1Ce	Россия	Watt	Contractor
Index	Activity Description	Cost	COSI	Coos	Costs	COSM	Costs	Costs	ConlingQt)C;Y	Costs	Costi	CostS	COsts	Cu FH1	Cu. Foot	Cu. FHI	Cu. Feel	eu.Feet	Will., Libss.	ManhotHs	ManhaUE
Period 2a	Period-Dependent Costs (continued)																				
	Pland energy booglet	×		- 1	-	-	-	2.710	406	3 1 t6	j 1958	1011		-				12	-	12	-
2	rIF'l: Fee-i	5	120	-	-	-	*	1,829	,8j	2.012	2 n,;		-			•	•	-	*	(*)	-
	E:fiil/gitin(::, Pllin'i.inJog @ursa	-	1.5		-	7	-	21!'S	:'8-:	1 Hig	-	3 1E;) R n.e;	-				3.5	-		-	ž
	SEXM rUtl Pool u.s.M.		(2)		151	100	-	rEi]i)	1145	9.775 augus	588	2 450	-				•		5	15	-
	Hid,rect Overhead Shousety, Stam of Sol			-	-		-	13 444	2.017	3/3/7 15.45k	5 315	10					-			-	LE1 657
	Utility 5,liiM Casi							24.45¥	3668	28.120	46:n	2] #8"?				- 15			Ž.	-	441 275
	Subtotal Period 2a Period-Dependent Rouse.		<b>4</b> 9	67	57	-	11)8	t.L. 101	lj;121	T.3 16.4	18,637	5J 34-6			3.99 f				79.817	145	894 932
2=10	TIZTAL PERIOD 1a COST		\$45	87	57		168	57 162	9.969	⊤8 <b>T5"J</b>	X1.710	58 043			3.991	-			79 817	0J<	894 902
PERIOD 2	2b - SAFSIOR DOfmilling with Diy Spelini Fuel S	torage																			
	Direct Ceturini who ning Activities																				
	Ctlarterly inspection									9											
	SiirtmNifinuEiliiii/1.ifiDnmentaf ii-J;-ii/) Prepare reports																				
	Bituminous 100f regiclateffur;							103	15	118	11:2				-		14			151	
	Mantenance supplies	2			- 1		- 1	_""?	1114	721	727	2		2	-			120		19	ā
	Subtotal Period 2n Activity Costs		Ů.			Ē	-	586	WI	1500	8:0	3						v	-		
Palacar 2n	Collateral Costs																				
	SUDGIN Fixed Clithetal films Tullillater				-			.1(#	51	467		J61				-			-	151	
	Subtoral PibiliC'Ett Collateral 60fs19					-	-	406	C1	487		JP	-		1.7	-		-	-	(5)	-
F±11000 213 1	PGL!!Idl-G.e.Pt=htdirnt COffdJj																				
	Insurance			-			-	1.123	132	145.4	1.405	45	-	-			100	15	-		**
	Property taxes		-	-		.=0		Jo	3.	33	16	-				-	180	-	-		W.
	jof alM physics '\$l.lpphU		>H}			-	-		F2	452	462		-			-	1-	-	-		*
	Dispolul Ut DAW generated			25	24	3=9	112	1.	24	1149	f.tq		7.0	-	1 698	1-	(4)	:=:	31 962	52	-
	Plant energy budget		•	-	-		-	61,	31	599	699		-	-	-	-	-	-	-		
	hRC Fees		-	-	-	-	-	a:<	8Z		903	-	12		-		-	-	-	921	
	Emergency oPJ,tnrung fete\$			-	-	-	-	1)ft	19	158 2£0	2.64	16ft					-	-	-		
	l'\(luaci Qi,u:freitd Settluthe Staff COff				-			3.048	Jr	3,≣05	DJ88	112}1			-	-	-	-	-	-	ēt 194
	UI,IIIIy&allCC:S1						- 0	Trestil	271	:C'4	2 0:4	11220									35 1014
	SubtDtal PoerlOd 2ld Penoo-Offpenl;i-l:/\t "::O"li		ro	2:9	26	151	712	e 034	( 2C3	8,710	8Jn	• 138			1 898		-	-	1:3808.7	62	124,503
2:0	TOTAL PERIODIZE CDS		370	29	24	-:	72	9 100	1"21	*1:017	8 242	t 13J5			1 t)a£l		5		3]%32	542	124 se;
PERIOD 2	Re - SAFSTOR Dormillilley without Spent FIKM Sto	Ofage																			
Pono4 2c i	D,																				
	Quarterly Inspection									- 3											
	Semi-annual et/intformental sur-H)									3											
	Pr's-p-8le reports							834		9											
	Bituminous roof replacement	-	-	-	-	-	-		125	959	IISS	-	741			-	-		•		
	Maintenance supplies Subtotal Period 2t Antally Conte			-	-			#5T; 5 501	1 16a 1 293	50!041 6800	58-11 S eOi			-		-	12	-	-	-	
Benezii	Penod-Dependent Costs																				
	Insurance	5		9	-	2		Ht J.43	11034	1137E	11 1175	2		12	12	-	12	12	u u		u u
	Property taxes	- 3		2		-		);H	34	200	265		-	12		-	-	120	e e		į.
	Health physics supplies		25894		-	-			749	3 743	3 743					-		12	2		u u
	6'\$-po5itH of DAW generated	-	-	211	195	-	580		003	\ 7CoJ	1.204				13 742			-	274 'SII	SII	- 4
	Plant energy budget							4 921	+38	5.fiSg	56S8										

Table D-2 Oconee Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Bud;): II V	olumes		Bun#II		Ulling
Activity		Oeeon	Romov*,1		TIMIt;POH	Processing		Other	Total		Uc:.hrm.	Management	Restoration	Volume	Class A	Clan B	Cliticas C	Olec	POCelofo00	Cian	Conli.
Index	Activity Osserlpphi;Jn	Cost	Cost	Costs	Cho≒	Costs	Costs	Costs	Contingency	Costs	COStli	Costs	CoStlo	Cu. Feet	Cu. Feet	Cu. Faet	Cu. Feet	Cu. Fëet	Wt. Lbs.	Manhours	Mamh
and 2r.	P't"ICd-DelJendMI Costs jtOg:f'ut.ij																				
4.6	Re MI-d	100		15				6.341	614	6.H5	6.975	-	-	-		-	-		-		
47	1"III-teel GI, "ffl:f'ad	-						1.857	;je	J 135	2.H5	-		141	14.1	-			-		
.a.u	Security Staff CGgl	-			_			Hi 784	2518	72)01	1930										38
4.9	vIII,:y Slafi COl;:	-			_		-	1.4 SSo1	2 180	1678:t	15,188							,	-		J1
0	E.Moul Feff.td 1: Period-Dependent Costs		2 994	232	195		58.0	55 o/t.J	8 362	57.416	61445				12".c."				274:942	_0";	
0	IC'''Al PERmo Lt COST		2 994	232	195		580	enien	Vified	74.24ti	741246				1314i				274 Mt2	501	
								61):5;')					-	-				-			
MOO 2	TOTALS	-	# 313	:>:	173	*	911	137 342	2' <u=< td=""><td>b,IO,£</td><td>'IJol '6!I</td><td>59.648</td><td></td><td></td><td>19&gt;136</td><td>3.7</td><td></td><td>*</td><td>388 1)1</td><td>708</td><td>77</td></u=<>	b,IO,£	'IJol '6!I	59.648			19>136	3.7		*	388 1)1	708	77
RIM I	a - Reactivate Site FolloWinig SAFSoTeR Dormillincy																				
	Vifect Decommissioning A'Ch-lies																				
1 t	Onergure Platfm(M-) decommissioning cost		30		ĕ			38	- 6	43	43	-	-	-	w.	-		-	-		
a1.2	Review ptInt 0/05 & spect							133	20	15J	1133	:=:	120	3	•						
13	Perform detailed rad survey									•	1										
1.4	End pUXh::t ddQ,IrtlOft						-	29	4	11	31		(*)	-	370		14.5			*	
1.5	Getailed in product myen Dry			-				2.0	.6	13	43		200	1-1		1.00					
36	Define major wick uniminor	170	(*)		-			217	36	:,0	250	100	200					*		-	
ť?	Porat1TI SE.P ;NICI E.II	-				-		90	1)	11)1	'01				~		*			-	
1 &	Pe-r'Ulm SII,,-SpoK-l't Cost Slut!,	-				-		145	202	Hill)	166			7-			-				
9	Prepare/submit License 'tfffqrrll;;)t\ Pbr	-	-		-			***	115	pry	<b>q</b> 36			100		141					
10	Receive NRC approval (II terminal Of fillin									•											
oi,ty St	ecifications																				
	Re-activate plant & (6:1100 liny famility	1.0	*				~	213	32	245	221		25	140	-		-				
	Plant systems		100		*		-	12'	18	135	125		7.4			120	9	2	*		
1.113	Reactor internals		120		-	-	2	206	31	2J	236		-	-		-		9	-	-	
1.11 (	Reactor vessel	2	(4)		-			198	28	215	215	4	-			191	-				
1.115	Biological shield	-	197				9		2	17	17	2	-							-	
1116	Steam generators				120	1	l.	90	1.4	154	104		-	12	-	121				- 2	
	Reinforced concrete				-	2		46		53	27	2	27		-						
	Man Turbine							12	2	13			13								
	Main Condensers							12	2	13			13	(0)	15						
	Plant structures & buildings							90	14	1 Go!	52		57	•		3.5	-		-		
	: Waste management				•		-	133	29	·S]	153			-						-	
	7 Facility & site closeout				151		-	26	4	30	15		15			-			1.0	-	
	Total							1.131	173	1 324	1.165		159								
	( * 1 · 10 · 10 · 10 · 10 · 10 · 10 · 10																				
	Site Preparations  Prepare dismantling sequence							5<	10	e,	80										
1.13	Plant prep & temp syces							2 100	405	3 105	3 105				-	1.5				-	
			:•:	-	191			41	6	1 100	3/100		1.0	10.51		(=)			(*)		
1.14	Design water clear-up system	*	-				-						~			-			-		
15	Rigging/Cont. Cntrl Envips/tooling/etc				(-)			2 100	315		2 419		-			1-1		-	1 - 1	~	
18	Procure casks/liners & containers				-	-		36	5	41	41		100	-		-		*			
	Subtotal Period 3a Activity Costs			-	141			5.904	1.036	7.940	7.782	-	150	*	3.4	140		-		*	
	Additional Costs										1										
2 I	018 Character/all						-	17352	376 376	t ijālt 11620	lue			-	14	-				E 16 F	
	Period-Bellendent Cods							,													
100 1.1	D'tiUran≘				61	910		J'd	28	306	JA	95	107	9	2			-	101	-	
9					-	-		Ja			JA		-			-					
#.1 4:2	P**()P*********************************							6	,	,	7										

TLO Sertines. Int.

Table D-2 Oconee Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						0.00	1.1 Pote:				NIDC	Caustra :	City	December		Districts	olumes		Bushell		Distinguish 4
Activity		Decon	Removal	Packaging	Transport	Off-Site Processing	LLRW	Other	Total	Total	NRC Lic, Term.	Spent Fuel Management	Site Restoration	Processed Volume	Class A	Class B	Class C	GTCC	Burial / Processed	Craft	Utility and Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet				Cu. Feet	Wt. Lbs.	Manhours	Manhours
Penod 3a	Period-Dependent Costs (continued)																				
3a.4.4	Heavy equipment rental	-	458	-	-	e e	4		69	526	526	-	-	0-0	-	-				-	-
3a.4.5	Disposal of DAW generated	2		5	-	· ·	20		Ŧ.	42	42	20	-	(4)	461		140	(4)	9.613	18	-
3a 4.6	Plant energy budget			5	2		-	1.334	199	1.522	1 522	-		191	-	-	121	1-1	-	-	-
3a.4.7	NRC Fees			-		8		214	21	235	236	=	120		-	-		-	-		*
3a 4.8	Indirect Overhead	•	-	-		8	-	1 199	180	1.378	1.378			12			-	543	(2)		
3a.49	Security Staff Cost		-	-		-		162	24	186	186	9	•	-	920	-		-	-		6.257
3a-4,10	Utility Staff Cost	1.5					-	10.709	1.606	12.31€	12,315		•		***	-			9.613	-	200 229
3a.4	Subtoral Period 3a Feriod-Dependent Costs		838				20	13,892	2 230	15 995	16.995	3.5			461			-	9/5/13	18	206.486
3a.0	TOTAL PERIOD 3a COST	-	835	4	7	1	20	22.048	3,641	26 563	26.404	16	159		451			150	9 613	E 185	240.950
PERIOD:	3b - Decommissioning Preparations																				
Period 35	Direct Decommissioning Activities																				
Detailed V	Vark Procedures																				
	Plant systems		-	-	-	12	8	185	28	213	192		21	1-1	-				-	-	2 026
	Reactor internals	2	-	-		-	-	98	15	113	113	*		-	3=0	-	-	-		140	1,070
	Remaining buildings	-	7	-		-	-	53	8	51	15	-	46	121	-	-	-				578
	CRD cooling assembly	*	8	-	ū.	7	-	39	.5	45	45	-	-	191		-		(-)	-	-	428
	CRD housings & ICI tubes		E	-		-	-	39	- 5	45	45		-	23	525	-	-	121	10	-	426
	Incore instrumentation	36	-	Ē.	*	-	-	39		45	45	12		-	120	-	-	1-2	-	-	428
	Reactor vessel	-		-		=	8	142	21	184	164	•		-	-	-	•		-		1 554
	Facility closeout			-	-	-	=	47	7	54	27		27		-		-	-		- 1	514
	Missile shields		-	:=				16	3	20	20	15	-			-	-	-			193
	Biological shield	151	-	(5)	-	-	-	47	00	54	54	151		-	(7)	-	-	(5)	1.5		514
	Steam generators		-	: -	-	-	~	180	27	207	207				1.51	-	17.0	:51	-	101	1,969
	Remforced concrete			-	-	-	-	39	-6	48	23	-	23			1.51	1=				428
	Main Turbine			-	-	-	-	61	9	70	-	180	70		-	1-1	-	-	-		668 668
	Main Condensers	-	-	-	-		-	61	9	70	Jin		70		-	170		-	10.		1.168
	Auxiliary building			-			-	107	16	123	111	*	12			100	100	75			
	Reactor building					-	-	107	16	123	111	-	12		(4)		-	-	-		1,165
3b 1 1	Total			*				1.263	169	1.452	1 171	-	282			-	-		-	-	13,600
3h 1	Subtotal Period 3b Activity Costs	12		-		=	-	1.263	189	1.452	1,171	-	262	12	1-1		-	€	1-	5.40	13,800
	Collateral Costs									521007041											
3b.3.1	Decon equipment	883	200	-		-	-		132	1.016	1,015	-	-		-	-	-	-		-	-
30, 3.2	Pipe cutting equipment		1,000	2	-		5		150	1,150	1,150			-	-	-	-	-	-	-	-
36 3	Subtotal Period 3b Collateral Costs	883	1 000		-	ä	ē		282	2 166	2 168	-	•	-	-	-	-	-	120	-	
	Penod-Dependent Costs	27								34	34							200			
3b.4.1 3b.4.2	Decon supplies	27		-		-	-	160	15	176	176			1.5	-	-		- 5			
30.4.3	Insurance		-	-	-		-	100	8	4	4	-	:50			(5)	-			1.5	
30.4.4	Property taxes		203	-		-	-	2	51	253	253	15	151	(5)	151	-	-				5.0
36.4.5	Health physics supplies		228			•	-		34	262	262	1.5	-		1.5	-	-	100			
	Heavy equipment rental		220			-	3.4		4	23	23	-		-	361		-	-	5214		
36.4.6 36.4.7	Dispinsal of OAW generated			ч	4	-	- 1	660	99	759	759			10	201				2 (4)	u	
3b 4 8	Plant energy budget NRC Fees	-		:-	-	-	-	107	11	118	118	100	· ·						-		
3b 4 8	Indirect Overhead			-	-		-	816	122	938	938	-		-	-	-	*	-		-	
3b 4 10	Security Staff Cost		-	100	-			81	12	93	930			101	-	-	-		-		3 120
3b 4 11	Utility Staff Cost	-		12	-		-	7.518	1.128	8 646	8 646			-					-		136 240
3b:4	Subtotal Period 3h Period-Dependent Costs	- 27	431	- A	- 4		11	9.344	1 483	11 304	11.304	-		-	261			-	5.214	9	139.360
		200		4	4							-		-			1.53	-			
3h 0	TOTAL PERIOD 36 COST	910	1 431	A	4		11	10 607	1 955	14,922	14 641	-	282	-	261	-	141		5,214	9	153,160

Table D-2 Oconee Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

					Off-Site	LLRW				NRC	Spent Fuel	Site	Processed			/olumes		Burial		Utility and
Activity Index Activity Description	Decon	Removal Cost	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	Other	Total Contingency	Total Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu, Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contractor Manhours
PERIOD 3 TOTALS	910	2.269	13	11		31	32.655	5.596	41.485	41,045		440		741				14,826	8.194	394 120
ERIOD 4a - Large Component Removal																				
enod 4a Direct Decommissioning Activities																				
Nuclear Steam Supply System Removal ia 1.1.1 Reactor Coolant Plunig ia 1.1.2 Pressurzer Relief Tank ia 1.1.3 Reactor Coolant Plumps & Mathis ia 1.1.4 Pressurzer ia 1.1.5 Steam Generator Units ia 1.1.6 Refered Steam Generator Units ia 1.1.6 Refered Steam Generator Units ia 1.1.6 Reserved Structure Femoval ia 1.1.6 Reactor Vessel Internals ia 1.1.7 CROMSIGN Femove Structure Femoval ia 1.1.8 Reactor Vessel Internals ia 1.1.1 Reactor Vessel Internals ia 1.1.1 Reactor Vessel Internals	28 22 22 85 24 55	138 10 69 45 1417 72 1826 2889	16 3 40 324 671 671 235 3 050 913	18 3 287 750 62 290	120 23 143	127 23 2 312 1 177 11 288 13 268 13 4 4 523 9 745 5 647	159	102 14 575 341 3 478 3 003 101 4 567 1 462 6 523	545 79 3 548 1 894 18 031 15 722 560 14 568 11 213 18 236	545 79 3 548 1 894 16 031 15 722 560 14 568 11 212 18 235			483 94 498 374	483 94 8 997 1 847 12 866 12 866 3 053 1 263 6 862	761 2 573	517	440	111 944 20 849 824 389 107 604 1 810 770 75 534 284 435 79 646 961 005	3,930 333 4,062 1,796 10,254 5,400 2,221 18,863	750 750 867
4a 1.1 Totals Removal of Major Equipment	163	7.874	5 923	2273	315	47.365	317	20.258	84.493	54.493		÷.	1.449	48 331	3 325	517	440	6.086,948	65-763	3,275
4a 1.2 Main TurbinerGenerator 4a 1.3 Main Condensers	*	263 802	175 91	-28 14	765 535		ž	202 292	1 434	1 434			4 020 5,310	:		:		341.722 238.934	6 563 20 501	
Cascading Costs from Elean Building Demolition ta 1.4.1 Reactor Building 4s.1.4.2 Auxiliary Building 4s.1.4.3 Turbrie Building 4s.1.4.4 Fuel Building 4s.1.4.4 Fuel Building	:	710 92 155 70 1027	:	:	:			100 14 23 10 154	816 105 179 50 1181	816 105 179 80 1181	•	-	- 1 - 2 - 3 - 4		:	:	:		9 379 1 333 2 697 961 14 370	:
Disposal of Plant Systems 1a.1.5.1 Chemical Addition 4a.1.5.2 Chemical Addition RCA 4a.1.5.3 Condensate 4a.1.5.3 Condensate 4a.1.5.4 Condensate (Contaminated)	:	27 22 529 526	0 34		2ú 254			4 9 79 561	31 57 609 3.961	52 3.961		31 609	222 30 383		:		:	9 01fi 1 233 881	821 501 15 699 13 466	÷
4a 155 Condenser Circulating Water 4a 156 Electro Hydraulic Turbine Control 4a 157 Feedwater & Emergency Feedwater 4a 158 Feedwater & Emergency Feedwater (Cont.)	:	338 18 163 148	5		443			51 24 106	389 20 187 715	715	*	389 30 187	4 873	:	:		*	187.906	10 040 499 4 862 3 763	:
ta 1.59 Feedwatel & Emergency Feedwatel RCA ta 1.5.10 Heater Drams (Contaminated) ta 1.5.11 Heater Vent ta 1.5.12 Heater Vent ta 1.5.13 Heater Vent		237 368 254 31 24	. 7	13	438 493		•	127 55 140	820 423 907 36 27	907		423 36 27	4 815 5 419	:			: :	195 560 720 074	5 531 11 003 6 466 1 002 729	:
ta 15 14 Hydraulic Oil ta 15 15 Hydraulic Oil ta 15 15 Hydrogen Seal Oil ta 15 16 Hydrogen Seal Oil ta 15 17 Low Pressure Extraction		28 39 36		:	ė			0 4	3 32 34 41	•		3 32 34	:						75 848 923 1,095	:
4a 1.5 18 Main Steam 4a 1.5 19 Main Steam RCA 4a 1.5 20 Post Acodem Monitoring 4a 1.5 21 Reactor Building Stray	:	84 304 29 88	37	65 1 5	2 530 37 191	:		13 489 13 82	97 3 406 80 339	3.406 80 339		97	27 808 401 2 105				:	1 129 284 16 304 85 488	2.558 7.693 785 2.150	:
4a 1521 Recirc Cooling Water (Shared 182) 4a 1521 Recirc Cooling Water (shared 182) RCA 4a 1524 Sample Monitoring 4a 1526 Stator Coolant		182 122 99	3	- 4 13	250			27 55 49	209 341 270 56	341 270		209 :	1727	312				78.146 47.870	5 547 2 887 2 704 1 507	:
#a 1 5.26 Steam Drain		81	2				-	12	93			93	-	-			-		2 668	

Table D-2 Oconce Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

		_				Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Theretal V	olumes		Burial /		Memory
Activity		Decon	Demousl	Packaging	Transport	Processing		Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GICC	Processed	Craft	Utility and Contracto
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet			Cu. Feet	Wt. Lbs.	Manhours	
Disposal	of Plant Systems (continued)																				
	Steam Seal	(4)	48	1	1	48	12	-	19	118	115		*	533		-		-	21 648	1 150	
	Turbine Oil		121	-	-	_			18	139	1-1	~	139	-		19	-	-	-0	3.518	
4a 15.29		- 1	334	-	i i i i i i i i i i i i i i i i i i i	-	18	12	17	131	( <del>*</del> )	-	131	-				*	Section (Control	3.438	
4a 15	Totals	-	4,102	110	193	1.66	Ę1		1.933	13.566	11.008		2 558	78 777	312			-	3 227 177	113 926	
4415	Scaffolding in support of decommissioning	2	411	8	2	44	5	72	112	581	581	420		433	27		2.7	-	21 916	12.903	
4a 1	Subtotal Period 4a Activity Costs	163	14,479	6 305	2510	8.824	47.435	317	22 951	102 988	100,430	P.	2 558	89 989	48 570	3.325	517	440	9 916 696	234 029	3.27
Period 4a	Collateral Costs																				
4a 3.1	Process liquid waste	15	-	9	26	-	38	-	23	113	113				145	-			8 691	28	
4a 3.2	Small tool allowance	-	155		-			-	25	191	172	-	19	-		-	1.0		1.50	_	
4a33	Survey and Release of Scrap Metal	-	70.7	-			-	377	56	433	433	-				-			-	-	181
4a.5	Subtotal Period 4a Collateral Costs.	19	166	9	23	•	38	377	105	738	718	-	19	18	145	-		-	8.691	28	181
Period 4a	Period-Dependent Costs																				
4a.4.1	Decon supplies	50		141	-	-	190		12	62	62	-:	-	-	-	-			-	-	
4a.4.2	Insurance	-		-	=	7-7	140	294	29	323	323	140		-	-	-	-		-	-	-
4a 43	Property taxes	120	-	121	-	0.00	12	- 6	1		6	(4)	1			-	-	2	(4)	-	190
4a.4.4	Health physics supplies	100	1.403	191	-		100		351	1.754	1.754	100	-	(=	-	-	-	-	(=)	-	(-)
4a 4.5	Heavy equipment rental	120	2.019	121	2	2	12	12	303	2 322	2 322	120	=	-	-	-	-	2	-	-	(2)
4a.4.6	Disposal of DAW generated	100	110	50	42	520	124	12	42	257	257	127		2	2.932		. *	14	58 642	107	190
4a 47	Plant energy budget	120		197	2	12	15	1.154	173	1.327	1 327	-	2	-		-		-	-	-	120
4a.48	NRC Fees	120	- 8	180		38	16	414	41	455	455			2			2	2	120	2	0.00
43.49	Liquid Radwaste Processing Equipment/Services	-	-			-		344	52	305	396		2	2	- 8		9			9	-
4a.4.10	Indirect Overhead		-	150				2.097	315	2.412	2.412				- 1	- 2	-	2	4.	9	-
48.4.11	Security Staff Cost	-						526	79	805	605	-		_		8			-		20,57
4a 4.12	Utility Staff Cost	-	-		-		1-	19/925	2.989	22,914	22 914	101				-	-			-	350.31
An A	Subtoral Period 4a Period-Dependent Costs	50	7.422	50	42		124	24.760	4 367	32 834	32 833		1		2.932	15		•	58 642	107	370.89
4n.0	TOTAL PERIOD 4a COST	230	*8.068	6.354	2.677	8.828	47.596	25 454	27 442	135.559	133,982		2.578	89 989	51 747	3.325	517	440	9 984 029	234 164	374.16
PERIOD 4	to - Site Decontamination																				
Period 4h	Direct Decommissioning Activities																				
46 t t	Remove sperit fuel racks	278	32	122	58		479	10	289	1.269	1 269	-:	-		2 450	-	-	-	219 804	955	100
Disposal	of Plant Systems																				
4b 12.1	Component Cooling	90	47	91	-		141	100	7	54			54			-		-	-	1,374	
46122	Compenent Cooling RCA	i.	116	2	3	130	141	190	49	300	300	-	2	1 430		-	~		58 079	2,674	
	Core Flood	327	97	3	5	192	191	100	54	351	351	21	-	2.110			-	-	65 669	2.358	
46124	Electrical (Clean)	120	583	121		12	121	12	87	570	-	-	670	B		-	~	-	200	16 348	
4b 1.25	Electrical (Contaminated)	-	169	3	5	143	8		67	394	394	14		1,572	42	-	÷	-	67.572	4,112	
4t: 1.2.5	Electrical (Contaminated) RCA	-	3 194	.20	38	1.381		(8)	513	3,744	3 144	120	11.60	15,179	100			-	616 430	28.393	
	Gaseous Waste Disposal (shared 182)	756	317	34	37	149	237	36	170	944	944		0.00	1,638	1.267	2	2		175 126	7,531	
4b 123	High Pressure Injection		787	118	755	2.213	745		756	4.885	4 885		8	25 429	3.812		2	2	1 374 364	19 505	
45.12.9	incore instrumentation		15	. 9	9	0.5	3	0.70	a	22	22	-			13	ĕ	×	8	1.168	406	
	Liquid Waste Disposal (Shared 182)		1 346	110	135	501	552		558	3.611	3611	-		5 503	4 610				518 897	32.839	
46 1.2 11	Low Pressure Injection		456	35	55	753	25G		301	1.850	1.850	.53	-	8.280	1,314	=	-		450 790	11,500	
	On-Site/Off-Site Power		344		-	181		-	7.4	108	-		108	18					5.0	2.817	
40 1 2 13			1.49	7	11	440	181	(8)	106	712	712		-	4,842			-		196 641	3.691	
46 12 14	RFS Refueling Water		40	1	1	51	(8)	181	18	111	111	(2)		562		-	-		22,626	929	
	Radiation Instrument Alarm		11	-	-				2	13			13	-				-		323	
	Radiation Instrument Alarm RCA		29	0.00	.0	- 6		200	8	42	42		_	63		-	-		2.565	788	/ e
4b 1.2 16																					
4b 1.2 16 4b 1.2 17	Reactor Building Cooling Reactor Coolant	-	345 206	25 18	44	1.709	108	-	351 93	2 471 508	2.471 508		-	18 745 723	553				761 247 78 866	8.761 5.353	

Table D-2
Oconee Nuclear Station - Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

						Off-Site					NRC	Sperit Fuel		Processed	1	S		ш	Burtal /		Utility and
Activity	Activity Description	Cost	Removal	Packaging Costs	Transport Costs	Processing Costs	Disposal	Costs C	Total	Costs	Lic. Term. Costs	Management Costs	Restoration	Volume Cu, Feet	Class A Cu. Feet	Class B	Class C	Cu. Feet 1	Wt., Lbs. A	Craft C Manhours A	Contractor
Disposal	Disposal of Plant Systems (continued)																				
46.12.19	4b 1.2 19 Reactor Coolant Storage		440.	0.00	3	380	500		352	1,457	1.467	λ	ï	3.848	1.804	ī			302 444	10,919	ä
46 12 20	Spent Fuel Cooling	1	233	in pro-	17	612	101		144	358	858	,		3,003	807	,			193 703	5 788	,
40.122	Vertuation Clean		14 m		.1	-			e j	#1 to 10	-		198	. 200						0000	,
40.124	Vertiliano I constituine		0 0 0	4.1	11	100	1		707	000	0000		,	2 202				. :	2000 0000	2 4 20 4 20 4	
40.12	Totals		1604	2117	199	900	1885	. ,	4 084	35 205	24 161		1 044	107.235	14 222				5 587 401	167.513	
40 1 3	Scaffolding in support of decommissioning		616	5	(**)	: 8	101		19	57.9	27.0	æ		650	40			( <b>*</b> )	32 874	19 355	
40.149	At 1 Reactor Building	100	195	144	252	424	9427	,	099	3.896 E	3,936	•		4 658	10,211				884 565	31 333	ě
40 1 4.2		27.5	X	107	100	110	53		185	727	727	*	i	629	1.439		,	,	124416	8.853	ž
45.14.3		989	74	ůi.	OF 1		E.		th.	333	333				314			,	21 708	\$ 240	ř
40 44	Fuel Building	9 000	181	1000	100	n :	-			619	G 6	ř.	i	916	125				46233	8,672	
0.0	10,415	50.0	10	2	20.4	30*	0		0.75	0.00	0.00				72.725				1 200 921	2	
40 4	Supposal Penog 4b Activity Costs	101 107	9.229	763	1005	10.395	16 163		2 844	33.023	31,979	,	1,044	114 087	28.805	ÿ	·	,	6 926 999	261 921	*
Penod A	Penad 4b Aadhanal Costs																				
4b 2.1	Containment Paint Remediation	92		Ti.	17		99		69	264	262	•		ų.	452		ï			000	
40.2.2	License Termination Survey Management Program		,					0.15	10 (8)	901	901	,		,							0.240
40.2	Subtotal Period 4b Additional Costs	C1	,	1	-		37	194	75	1,069	1 065	r	ì	9	452			,		600	5 240
Period 4.	Period 4b Callateral Casts																				
1031	Process liquid waste	4		77	192	T.	100		6	100	306	e.		•	- Silver		÷		23.483	32	٠
40.32	Simal foot asoverice		100	100		20.00	**		200	000	2 0			2000			· ·	,	Section and		r
40.34	Survey and Release of Schan Metal				٧ .	8		1963	7 (7)	849	7 2		c 1	0000	9				30.5, 20.1	00	
45.3	Subtotal Penod 4b Collateral Costs	62	185	132	60	509	10	198	299	2.108	2.108	r		6,000	755	i	i	v	326,990	100	٠
Penod 4	Penod to Penod-Denendent Costs																				
40.4.1	Decon supplies	740	X			i		*	+8.5	928	926		×				,	i		V.	ž
45.4.2	Insurance		٠		i	i		449	4.5	494	494		ì	ı		·		i	ï	-,	•
404.0	Property taxes				,	,		47		10	10			1		ş		,	×	,	2
2 4 4 4	Health physics supplies		000		,				420	2007	1635										
40.4.6	Office of DAW denerated			90	, lá		(C)		58	352	352	. ,			4.020				80.393	146	. ,
45.4.7	Plant energy budget		à			ï		1,393	205	1.602	1602	×	,	,		,	,				
4b.4/8	NRC Fees				ž	ÿ		632	(F) (D)	694	659.65	,	3			,	,				
404.9	Liquid Radwante Processing Equipment/Services					à	101	570	n i	909	605		<b>3.</b>			,	,				
404.11	Security Start Cost							N. I. S.	123	1004	674					6.3					21,459
464 12	Utility Staff Cost			e a				201.05	3.015	23 113	23 117	СЭ		Č)							362.788
40.4	Subtotal Period 4b Period-Dependent Costs	740	4 745	80	67		166	26.087	4.981	36.847	36 847		٠	*	4.020				80,393	10	394 240
db d	TOTAL PERIOD 4b COST	2.468	14 155	066	1.173	10 989	4 523	27.268	11 379	73.044	72 000		1 544	120.057	34.042			,	7 334 382	263 032	400 480
PERION	BERIOD 44 - Dates profess Leaves Termination																				
1	to color brothe bresses in the state of																				
Period 4	Period 4d Direct Decommissioning Activities																				
Pariod 4	Period 4d Period-Dependent Costs																				
46 0.1	Instance		×			٠	,	,			. '			ŧ	ĸ	ě	×	ř		,	š
4447	Health physics supplies		108					n .	27	136	135										
46.4.4	Disposal of DAW generated			1.7	ra		43		19	11	11		×		130				2.594	10	

Table D-2 Oconee Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

LLRW NRC Spent Fuel Site Processed **Burial Volumes** Burial / Activity Decon Removal Packaging Transport Processing Disposal Other Class A Total Total Lic. Term. Management Restoration Volume Class B Class C GTCC Processed Craft Contractor Contingency Index Activity Description Costs Costs Costs Costs Costs Costs Costs Cu. Feet Cu. Feet Cu. Feet Cu. Feet Cu. Feet Wt., Lbs. Penad 4d Penad-Dependent Costs (continued) Plant energy budget 4d.4.5 4d,48 NRG Fees 222 114 22 17 244 244 44.47 Indirect Overhead 131 131 44.4.8 Security Staff Cost 5.143 44.49 Lithity Staff Cost 925 139 1.064 1,064 19 000 44.4 Subtotal Period 4d Period-Dependent Costs 108 2 5 208 1.598 1.598 130 2 594 5 27 143 40.0 TOTAL PERIOD 4d COST 108 208 5 1 598 1 598 27 143 130 2 594 PERIOD 4e - License Termination Period 4e Direct Decommissioning Activities 46.11 ORISE confirmatory survey 150 45 195 195 46 12 Terminaté license Subtotal Period 4e Activity Costs 4e 1 150 45 195 195 Period 4e Additional Costs 5.264 6.844 6.844 131 203 3,120 Subtotal Period 4e Additional Costs 1.579 6 844 6.844 3 120 Period 4e Period-Dependent Costs 46.4.1 Insurance 48.42 Property taxes 1.019 4e 4 3 Health physics supplies 815 1.019 204 Disposal of DAW generated 13 314 6.276 11 4e 4.5 Plant energy budget 229 de 4 E NRC Fees 354 389 46.47 Indirect Overhead 412 62 474 474 Security Staff Cost 40 48 18 140 140 4 691 4e 4.8 Utility Staff Cost 4.652 4.652 68.591 13 de:4 Subtotal Period Ae Period-Dependent Costs 815 5 136 961 5.935 5.935 314 6.276 11 4±.0 TOTAL PERIOD 46 COST 815 13 10.550 2.585 13,974 13.574 75.709 314 6 276 131,214 PERIOD 4 TOTALS 33 146 T 362 2.750 19 818 52,236 64,544 41 614 225 174 221,553 3.621 210.076 3.325 517 440 17 327 280 878,499 PERIOD 5b - Site Restoration Period 5b Direct Decommissioning Activities Demolition of Remaining Site Buildings. 56.1.1.1 Reactor Building 4.114 E17 4,731 4.731 53 465 56 1 1 2 Auxiliary Building 826 124 950 55.1.1.3 Turbrie Building 1.526 229 1.755 7.755 27,989 50 1 1 4 407 65 468 458 4 881 Fuel Building 648 7.45 745 9.163 1.128 8.649 8 549 107 510 Site Closeout Activities 5h.12 Grade & landscape site 99 191 56.1.2 Final report to NRC 61 70 568 Subtotal Period 5b Activity Costs 1.150 8 747 5b.1 7 606 61 8.819 107 702 668 Penna 5b Additional Costs Concrete Crushing 40 309 309 1 359 Subtotal Penod 5b Additional Costs 40 309 309 1.359 .

Table D-2 Oconee Nuclear Station - Unit 2 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LIRW				NRC	Spent Fuel	Site	Processed		Burial V	Volume≤		Burial /		Utility and
Activity Index	Activity Description	Decon	Removal Cost	Packaging Costs	Transport Costs	Processing Costs		Other Costs	Total Contingency	Total Costs	Lic. Term.	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contractor
Period 5h	Collateral Costs																				
5b.3.1	Small tool allowance		.78		190	-		12	12	89			99		12		-		_		
5b 3	Subtotal Period 5b Collateral Costs	٠	78	-	2	141	2		12	89	-		89	1.0		141		141		121	3
Penad St	Period-Dependent Costs																				
5b.4.1	Insurance	-			-	-	-	9	-	-		2	-	2	-		-			-	2
56.4.2	Property takes				3		8	13	.2	17			17		-	-	-			-	
5b.4.3	Heavy equipment rental		₫ 792				-	-	1 019	7.811		2	7.811			-	1.0			-	-
5b.4.4	Plant energy budget				3.		-	307	46	353			353		-	170	171			-	
5b.4.5	Indirect Overhead		-	,	181			739	111	850	55C					(5)		(*)	-	- 100	-
5b.4.6	Security Staff Cost		-		150	(5.0		160	24	184			184			2.50	(*)			-	5 050
56.4.7	Utility Staff Cost			-	121		-	5.888	1 033	7 921	-		7.921			8.00	0.0		-	-	123 420
5tr.4	Subtotal Period Str Period-Dependent Costs		6 792		(*)			8 109	2.234	17.135	850		16.285				.*				129.470
5b.0	TOTAL PERIOD SE COST		14 743	-	(*)			8:171	3 436	26 351	920		25 431			(*)	2.00			109 061	130,138
PERIOD	STOTALS	-	14 743		-			8 171	3 436	26 351	920		25,431	-	-		141		100	109 061	130,138
TOTALO	OST TO DECOMMISSION	5.843	59 448	7.811	4 599	19.018	55,683	291 541	82 031	528,074	435 993	62 588	29.492	210.076	134 572	3 325	517	440	18 174 065	836.745	3.742.245

TOTAL COST TO DECOMMISSION WITH 18.39% CONTINGENCY:	\$528.074	thousands of 20	08 dollar
TOTAL NRC LICENSE TERMINATION COST IS 82.56% OR:		thousands of 20	
SPENT FUEL MANAGEMENT COST IS 11.85% OR:	\$62,588	thousands of 20	08 dollar
NON-NUCLEAR DEMOLITION COST IS 5.58% OR:	\$29,492	thousands of 20	08 dollar
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC)	138,414	cubic feet	
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED	440	cubic feet	
TOTAL SCRAP METAL REMOVED:	43.985	tons	
TOTAL CRAFT LABOR REQUIREMENTS	828,579	man-hours.	

End Notes
Na - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
b - indicates that this value is less than 0.5 but is non-zero
a cell containing - - indicates a zero value

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed			/olumes		Burial /		Utility and
Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Processing Costs	Disposal Costs	Other Costs	Total Contingency	Total Costs	Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet		Class C Cu. Feet	GTCC Cu. Feet		Craft Manhours	Contractor Manhours
PERIOD 1	a - Shutdown through Transition							100													
Period 1a	Direct Decommissioning Activities																				
1a 1.1	SAFSTOR site characterization survey				V			381	.114	495	495	-			-	-		-	-	-	
1a.1.2	Prepare preliminary decommissioning cost		-	(*)	-	-		38	- 6	43	43	-			-	-		-	,=s		553
1a 1 3	Notification of Gessation of Operations									3											
1a 1.4 1a 1.5	Remove fuel & source material Notification of Permanent Detueling									n/a											
	Deactivate plant systems & process waste									a											
14.1.7	Prepare and submit PSDAR	147	2	1-1		2	-	56	g	67	67		_					-	-		856
1a 1.5	Review plant pwgs & specs.	-	2			-		38	€.	43	43			-:					-		656
	Perform detailed rad survey									16											
12 1 10	Eshmate by-product inventory	*				2	2	29	- 4	33	33	-	•	-	14	-	-		-		428
	End product description		-		-	2		29	4	33	33		-		14	-	2	2	-	-	428
	Detailed by-product inventory	-	•	-	*		-	43	7	50	50	120	8	-	-	*	-	-	-	-	642
	Define major work sequence	-	-					25 90	13	103	103	•		•					-		428 1 327
	Perform Site-Specific Cost Study							145	22	166	186				-	-	- 1	-			2.140
18	Trestative diverge cities and a	-	-	-	-	-	1.5	1.40		100		12.0									* 175
Activity 5p	echators																				
1a 1 16 1	Prepare plant and facilities for SAFSTOR			(*)	-			142	21	164	164		-					3	-		2.106
	Plant systems	-	-	-	-			121	18	139	139	-	-		-		-		200		1.783
	Plant structures and buildings			1.0	-	-		90	14	104	104	-	-	-					-	-	1 335
	Waste management		-	5.00	-		-	58	9	67	67	1.50						0			856
1a 1 16 5	Facility and site dormancy		-		-		1.0	58 469	70	67 539	67 538		*		-	-		-	-	-	856 6.936
18.1.10	oral	-	-		-			-901.19	1.0	539	238	-	-	-		-					0.936
Detailed V	Vork Procedures																				
	Plant systems	W1		-				34	5	39	39	9						-	-	¥	506
	Facility closeout & dormancy	-		-	12		-	35	5	40	40	-	-	-	=			-	-		514
ta.1.17	Total	-	~		-			69	10	79	79	127	-	20	-	2		-	*	2	1 020
10 7 10	Produce vacuum drying system							3	٥	1.5	3										43
	Drain/de-energize non-cont systems		-		•	-		3	0	b	3										77.0
	Drain & dry NSSS									3											
	Drainide-energize contaminated systems									3											
	Decon/secure contaminated systems									8											
1a.1	Subtotal Period 1a Activity Costs	-			(2)	-	3.5	1.415	270	1.689	1.689		-	*			-		-		15 361
Pennd ta	Additional Costs																				
	Asbestos Remediation	-	2.759	1	283	3-	2.164	-	1.273	5.481	6.481			40	25.455		-	-	330.915	35 451	
	Landfill and Fining Range Closure	-		-	-		-	818	82	900	-		900					-		-	-
1a.2	Subtotal Period 1a Additional Costs	-	2.759	1	2000	×	2.164	816	1 355	7.381	6.481	1 <b>-</b> 5	900	×.	25,455				330,915	35.451	
division of	Collateral Costs																				
	Small tool allowance	100	42		554				- 6	48	48	120									
18.3.2	Spent Fuel Capital and Transfer	-	- 44		12	· ·	120	735	110	846	-	846						-	-		
1a.3	Subtotal Period 1a Collateral Costs	24	42				151	735	117	894	48	846	-			-			-	-	12
Perind for	Penod-Dependent Casts																				
	Insurance							775	77	852	852	2	9	95	5				-		141
	Property taxes	-		2				1 384	138	1.522	1.522					2	-	÷		8	-
	Health physics supplies		586					11.00	147	733	733					-		2			
	Disposal of DAW generated	-		10	8		24		8	50	50	-			571	-	5	8	** 2.19	21	-
	Plant energy budget	-	100	5.52	12.		12.5	1 324	199	1.522	1,522		-			2				-	-
1a 4.6	NRC Fees	- :			1-1	17.	(8)	471	47	518	518.	(6)						-			-

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

			_				1.1.20047				MEG			-		В			D		A 12-70
Activity		Decon	Removal	Packaging	Transport	Off-Site Processing	Disposal	Other	Total	Total	NRC Lic. Term.	Spent Fuel Management	Site Restoration	Processed Volume	Class A	Class B	Class C	GTCC	Burial / Processed	Craft	Utility and Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs		Contingency	Costs	Costs	Costs	Costs	Cu. Feet			Cu. Feet				
	Period-Dependent Costs (continued)																				
1a.4.7	Emergency Planning Fees		1-1	-				281	28	309		309			-	-					
18.4.8	FEMA Fees		14.7					126	19	145	145	-		1.0				-			0.00
18.49	Spent Fuel Pool Q&M					-	-	745	112	857		857			1.0	-		-		- 1	100
18.4.10	ISFSI Operating Costs		-		-			109	16	125		125	-	100	100	-				-	rie:
1a.4.11	Indirect Overhead		-					2 135	320	2 455	2.455		141	2.0		-	-				140
1a.4.12	Security Staff Cost					_		4.566	685	5.251	5.251										157 471
18.4.13	Utility Staff Cost							19 239	2.886	22.125	22 125										356 857
18.4	Subtotal Period 1s Period-Dependent Costs	-	586	10	- 4		24	31.155	4 583	36 466	35.174	1.292			571		-		11.419	21	514 129
10.4														-							
1a.0	TOTAL PERIOD 1a COST		3 387	11.5	291	-	2.189	34 128	6,424	45.430	43 392	2 137	900		25 026			-	342 334	35 472	529.489
PERIOD 1	b - SAFSTOR Limited DECON Activities																				
Period 1b	Direct Decommissioning Activities																				
	ination of Site Buildings																				
16.1.1.1	Reactor Building	759	1.0						379	1,138	1.138		10	1.5		-				19 093	
	Auxiliary Building	343	180						171	514	514	-						200		9 084	1-
16.1.1.3	Contaminated Misc Structures common	14			-	-			7	21	21					100				379	-
	Hot Machine Shop(common)	45			-				24	72	72		(*)	-		1-0	-	-		1:267	
	Interim Radwaste Building(contmon)	97				-		-	48	145	145	_			-					2,570	
15 1 1 6	Radwaste Facility(common)	353							177	530	530					-				8.941	
10.1.1.7	Retired Steam Gen Storage Fac (common)	73				100			37	110	110									1.896	
10.1.1.8	Turbine Building	192		-	-		-		96	288	288	-			-	-				5.013	
16.1.1.9	Fuel Building	727					-		113	340	340					-	-			4.581	
1b 1 1	Totals	2.105				-	-		1.053	3 158	3 158					-				53 224	
10.1	Suprotal Period 16 Activity Costs	2.103				-			1.053	3 158	3.158									53,224	
Ferrard 1b	Additional Costs																				
1b 2 1	Spent Fuel Pool Isolation		100			20		6.272	941	7 212	7.212		2			-	120				
16.2.2	Landfill Post Glosure Maintenance				(5)			10		11		2	11		- 1	1.5					
10.2.3	Mixed Waste Disposal					.15		. (0,	3	27	27	4	- 100	120		150			7.363	92	
10.2	Subtotal Period 1b Additional Costs		-	-	2	15		5.782		7.251	7,239	-	11	120					T 363	92	
						1.0		0.462	945	(-60)	1,245		11	120	-	100			1.303	94	
Period 1b	Collateral Costs																				
1031	Decon equipment	883		191	100		1.0	-	132	1 016	1 016			-	-5.	(6)		· ·			
18.3.2	Process Inquid waste	220		44	132		193		128	611	611		16	100	751				45 068	145	-
16.33	Small tool allowance	-	3 "	-				-	5	4.3	43	1.4			-					-	-
15.3.4	Spent Fuel Capital and Transfer		-	-		-		75	11	87		87		- 1	-	-					-
1b.3	Subtotal Period 1b Collateral Costs	110.4	37	24	132		1.5	75	278	1.756	1.669	87	-	-	751				45.068	146	
	Period-Dependent Costs																				
10.4.1	Decon supplies	1.059	1-		1-1	1.0	140	*	265	1.324	1,324			-	-						-
16.42	losuitance	-	1-1	-			Ac.	105	20	215	215			-					100		
tp 4 3	Property taxes		160	54.0	140			349		384	384						2.00				
1h 4.4	Health physics supplies		337		2-1				84	421	421									-	
16.45	Heavy equipment rental		115						13.	133	133										
15.4.5	Disposal of DAW generated	-		100	12				11	64	64				734		-		14.672	277	
TE 4 7	Plant energy budget		-			191		-334		384	384	3			1				redie		
10.4.8	NRC Fees			-		1.0		11%		131	131	1	-								
1b.4.9				-	-			7.7		7.6		79							-		
10.4.10	Emergency Planning Fees				-	-				37	3-				-		-				
	FEMA Fees					-		32				240		-	-	-					
10 4 11	Spent Filei Pool O&M			•		-		188		216		216		-							
1b 4 17	ISFSI Operating Costs				-			27		32		32	- 1	-			-			-	
16.4.13	Indirect Dvernead					-		538	81	619	519				-						6

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V			Burial /		Utility and
Activity	Activity Description	Decon	Removal	Packaging Costs	Transport Costs	Processing Costs	Costs	Other	Total	Total	Lic, Term. Costs	Management Costs	Restoration	Volume Cu. Feet	Class A	Class B	Class C Cu. Feet	GTCC Cu. Foot	Processed Wt., Lbs.	Craft	Contractor Manhours
		5001	110.01	MARIE	00313	0.0010	14.00312	0000	Gommyuncy	Coats	OOats.	State	Outs	Current	Curren	Sur Freez	54.7001	GU 1.001	*****	mannours	Manneurs
	Penod-Dependent COlol(t)(onflirtued)							a sets			. 1.4										0.000
12 A 14	Security Staff Cost	-		*	-			1 191	727	5517	; J;4 5571										39,691
nand	Southful PeNOC 1p Selt of Dependent 0:0.7"	1 059	t,i'i,d	12	10		31	7.853		\09;;	1C6H	329		-	73:4				14.00	27	129,589
ш.			,0	12	19	î.	3.		1,518	(02,,	10011	943		-	1 Opin				14:4:	41	(129,000
15.0	TOTAL PERIOD TOUSE	4 156	'So':!	63	145	15	227	14:10	3 794	21.102	:1.678	412	11	120	11485	٠	*		6; 104	∄3 JS9	179 :39
PERIOD	11: - Ptep#IMona for SAFSTOR Dormancy																				
Period 1c	Direct De.:ommiSSIOIning Activities																				
C 11	filiGrace support equipment for storage		33S						58	446	446	-								] CO <sub>i</sub>	
1: 12	tribial containment frinsulin equal 1/65		32		-			-	F	35	H				-					'00'	-
H: 13	Ifflenni survey Bliot to comp(*lby				9-6			713	<20	953	954	(4)		-				*		101 101	-
16/14	Secure Wilqil'Q ercettes									- 1											
11 1 5	Preple is julional reason tidulal!			-	120		-	17	,	19	- 10		-		-					*	250
lei	Stibit: IfaIP* NoX! 1d Activity Costs		420	•	-		-4	-SG	285	1.459	14\$\$		-	ē	-	*		8	*	17 50t	250
Penga ta	Additional Costs																				
1021	Lindin Post Ciprott Materialise		121	-	-	120		10	1	16			1.1	9	8				¥3		-
It: 2	Sut:total Penod ic AcMt/O.at Costs			•	-	-		10	1	11			11	-	- 4		-			*	-
	Codater,1 Costs																				
1631	Process liquid waste	1)341	-	34	15J	121	231		156	7.40	740		15		910				54 fj1Q	777	
1c.3.2	Small III d allowance		3			1.5		-	0	•	•		191	-	-				-		
1::33	Spent Fufti Cil;(fill and TillMlt)	#1.	100			100		113	11	el	5.0	87		-	-		*		200	500	
16.3	Silurulintal interless to Collateral CO&.p.	134	B	§4		-	23r	75	151	H3)	744	67			910	-			'SJ 6'D	177	
	Period-Dependent Costs	•																			
5.c.4 I	IntilotifNice		3.0	-	-		14.1	$E^{*,*}$	20	215	215	-	120	-	-				2		
1:,4.	Property taxes		141	34	1-1			332	32 41	357	35-	-	-	¥	21	-			*		
1e,43 1c.4.4	HuM1 physics supplies		186	~	-	-		-	4F	233	nJ		-	-	-					•	-
1c.4.5	Heavy equippownf trictal Disposal of DAW generated	-	115		- 2		. 5			13)	13I 13		1.5		544				J 87"6		-
letelfi	Funi energy (IL/1gel		-	4	- 2		5	3-24	50	384	384	-	3.5	-	jad				38/0	5	
1::017	NRC Fees							11.3	12	131	131				- 5		- 1		Ĉ.		
10.4.8	Emergency PIMMINV Fees		-	-			-	- 11	7	75		76	-								
10.49	FEIIIA Fen				-		-	3:	S	17	37	-	-	-						-	
1c.4.10	Spent First Pool Off(I)	2		-				:!t1	26	216		21€	-							-	
10,4,11	ISFSI Operating CO\m			-			-	n	•	Ht	-	32		-		-			-	-	
10.4.12	Ifichirta ()vtrtitaa			-				538	81	619	619			-	-	*					5.50
1c 4.1] 1c4(-14	&K1.glt- SIAIf Our Li411/ SIs*! Cost	•	-	-	-	2.50	-	1 151 4 54/1	17.3 =23	5.577	1 1204 5:577	-			-	*		•			39 ea!
10	Subtotal Period 1-: "e-JOd-tilue:,entCQttt'		302	. 2	2		- 5	T.829	1,2 <del>00</del>	9.345	VC:OU	,125			344				2 678	5	1}(jSBi
m: 0	T1:"ITALPEFIICD 't::CST	194	724	36	182		rw.	- G6o'	1.658	TI:IAJ	11)ICj	<b>±12</b>	11		1 (3'94				57 461	17 984	129 838
PERIOD	1 TOTALS	a J'il	# 801	10H	5.4/lt	16	2 667	"I1V.;	1: 576	81 174	"128'1	2 962	913	127	28 565				N.:e Eo:!	105.945	788 sl<::
	2d - SAFSTOR Commane: V with Wat Splint Floili Ste		-110	541	000		* 441	or i way	11. 11/10	******	1201	2,302	.11	1.26	AH SAVE				1406 100,:	15/11/2/93	100 MAG
		9=																			
renod za	Oo'tEl V.ccoT'rmu'CfVIQ Achaptiet Quarterly litSpertoOTI									192											
2a 1 2	Semi-annual life vill'; mml'ni; ji to')r'i;,									-											
										-											
la 1.1	Freoin: relatinft.																				

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V			Burnal /		Utilit
Activity	Activity Description	Cost	Removal	Pax:lalging Costs	Ilanspott Costs	Plocenmg Easts	OlSpora3il Costs	Costs	folal LOI/Ungeticy	Total	Lie Telm.	f(A,)nagemefil Costs	Restolcation Costs	Voluniit Cu. fait	Classia Cu. feet	ClasuB Cu. Feet	Clm, C Cu. Feet	GTCC Cu. fleet	Processed WL, LDS	CI,III	Conlt
15	Maintenance supplies				-			1 188	297	1.485	1 485										
1	Subtotal Period 2a Activity Costs				-	-		1753	3PC	2.t35	2.135			- 2	:	- 8		-			
011:	Additional Costs																				
2.1	LaMf/II Pvst -C'o5un: Manler15"c.e	~						19'	19	nn			430								
2	SutActtli Period 2a Additional Costs.		-		-	1.00	•.	'n'	:01	ШО	-		4111					-			
ud.İlə	Collateral Cours								"												
1:	SPfe"It fufol Capull and Ir.rlfl-a-						-	:OW3()	447	)43:		1 0.127		-	~		-	-			
L	Subtotal PriQij:/1 C/Udlffrd;;:Toll+	141						2!!!j)	94 <u>7</u>	3 427		3 427					*	*		-	
:88:314	t'lt"w-Cf'pef".jHt eV0											1									
4	insurance				2			1.070	100	3 3 J 1 4 56 3	2:893	4 599				-	-	-			
2	Property taxes			121	-	12	141	4 148	4 15	4 563	ar.	4.496				2	2	-			
3	Health physics supplies		§=;=		-				2tii	10%	Con			141			¥				
4	Disposal of DAW generated		- 1	53	< •		'eg-;		- 11	323	123				3.585	. 4			73 707	134	
4.5	Plant energy budget		-		-			2 502	115	2 IFI	1.439	1429	-	-			2	-			
1.5	NRC Fees		-			-		15M	'('2	1858	1 858	-	-	-	-	2					
7	Emergency Planning Fees		-		-			2.655	;M	2 92C		2 920	-	-		-	-				
8.	Spent Fuel Pool D&M	-	-	-	-		-	a'i	1.057	8 re.1		5:101				2		2			
9			-					tCJJ	111	"e:5		1 11!!	2						-		
10	1SFSI Operating Costs 100":12 Gerhill(J						-	2 439	366	2.805	":;p	2 262	-	-	-			-	-		
1 1 t	Sacutrt. Staff Cost		-		_		-	12.415	'11fj2	14.277	4.906	:oJiO	-			-	-				
	Uturly 514" Cortl		-				-	22:50:)	3 387	:"!,?	4 2769	21 698		-					-		
	Satisfield "er'vd 2s FellxHifepyrntin: Chika		70	55	1.7	-	155	59 533	8 626	69 306	11 385	51 91 I			1189	-	-		73.707	124.	
	1,j1A_ProllOW ;"; COST		877	4:	52	- 4	155	94 558	9.494	:\2!.,	9 530	55 JUH	4,30	-	3.685				13 707	1JA	
IOD	II" - SAFSTOP Dormancy wittl 0" y SPIIII furl 51	וויוסוטי																			
off De	Direct Decommissioning Ox Thes																				
1	Quarterly inspection									10.0											
12	Semi-annual environmental torids									,											
13	Percupt algorit																				
1.4	Bituminous roof replacement							251	41	316	316		27	121	2	-	-				
1.8	blorder.ancandk,"							C	100	1,5 *	721						-				
1	Suptotal Penag 2b Action Costs							,200	185	1.037	t IN-						-				
00.2h	Additional Casts Landfill Maintenance Perpetuity							416	10	458			458								
2	Subtotal Period 2t Additional Costs							418		J2i1		-	458			-	-				
od 2b	Collateral Costs																				
	Spent Fuel Capital and Transfer							J <sub>2</sub> ,*	9.4	636		411				-	-				
3.9	Subtotal Period 2b Collateral Costs							427	7.± 84	491		491	-	(*)			(=)		-		
3	Period-Dependent Costs							1.922	181	1.454	(4)!	29					-		190		
,,,drt.	Penod-Dependent Costs h-iUIJ/Ve							in.		n	33				-	-					
,;,d:t.		:		:		-	-														
3 ,,,,,d?t. † 3 4:⊋	h-iUI;J'V.: Prupe"y loJft"l	:		:					92	482	462		100			- 1	-	-			
,;,d:t.   1  ;⊋   1	h-iUI,J'V.: Prope'ty loJit'i Health J'I rauto supplies	:	2.ki			:	- 73			482 No	140				16	-	-		3) 962	412	(
a ,,,,d:t. 4:2 1-1 1-4	heiUld'Ve Proper'y loditi'i Health gitrauto supplies Ollipotusia L.! OAW geflob' stee		ina :	29	50		173		92	No)		:	•		16				3) 962	41	
3 4,1,d2t. 4,2 4,1 1,4 4,5	h-iUI;JV Prupery loutri	-	: :72	20	2ª	-	72	688	92 24		242			•	16		-	:	3) 962 -	712	(
# 1 4:9 # 1 # 4 # 5 # 6	h-AUI/M/s Properly touter H-AUT of treate supplies Oillopated to DAW gellobistee oilsont ratempt budigith; FiftC Fees			200	21		72	688	92 24	Ne)	141 699	168	-		16				3) 962 - -	412	
3 4;2 4;2 3 1 3 4 4 5 3 t 4 7	h-BUISIVe Properly Golffi Health Straute Supplies Ollipotatist LF OAW geflobitee Gloom ratering bedight; HRC Fees Emergency pramering field.		IM	****	- - 2u		72	608 121	92 24	Ne) ipg 801	699 903				16				3) 962 - -	42	(
3 ,,,,dit. pt 1 4;2 # 1 4-4 4-5 # t	h-AUI/M/s Properly touter H-AUT of treate supplies Oillopated to DAW gellobistee oilsont ratempt budigith; FiftC Fees		IM E	**************************************	2 <sup>2</sup> 1		: 72 :	688	92 24 41 12 13 75	Ne) pg 801 1M	699 903	166			16				3) 962 - -	12	(

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

1			*****	70000	DISTRIBUTE TO STATE OF THE STAT	Off-Site	LLRW			F-2008 104-00-	NRC	Spent Fuel	Site	Processed		Burial V			Burial /		Utility and
Activity	Resulted Property and	Cost	Removal CQsI	Packaging Costs	Costs.	Processing	Disposal Costs	Other	Total COntinbalticy	Total Costs	Lic. Term. Costs.	Management Gos.ts	Restoration CosEs	Volume Cu. Fikit	Class A Cu, Fikit	Class B Cu. Fl/Ot	Class C	GTCC Cu.#Mit	Processed WL.Ibiss	Craft Manhours	Contractor Milnhow's
index	Actilith) Description	Con	Cusi	Coats	Costs.	Costs	COSIS	Cosis	Conungancy	CUSTS	Costs.	(405./5	Coses	Cu. Firm	Cu, Fixit	Cu. Foot	Cu. Fati	Cu. myer	W11D385-	manmours	Marinowa
	Penad-Dependent Costs (continued)									- 200											
	Utility Staff Cost	-	101		127	140	-	s:n	2-1	÷ 0,	2 C7A		12	19	-	-	-	30	20000000	*	JI3 le'l≐l
2h 4	Subtotal Period 2b Period-Dependent Costs.	×	J-1)	29	9.2	2	72	8.544	1.278	10 278/3	9 3 12	1913	12	(=1)	T69-rp	-		-	liger	15.2	124 SO
2E 0	1CTALPERHIL 2d COST		270	29	24	*	72	10 209	1.569	12.272	é mtJ	2 405	4158	10	1,698				33 952	-62	124 503
PERIOO .	2t SAFSTOR DOfmanCy without 'Spent FLiill' stork	igit																			
Plentod 2s	O.r.: 1 OeremmfUJo.liwg Activities																				
1c.1 1	Quarterly Inspection									8											
20,12	Semi-annual environmental survey									а											
2c.18	Prepare fe-ports																				
20.16	Bruminous mo( rflplacement	-	141					2,277	3,03	· ellé	;GHI		-	1.0	181	141	181	0.00	100	181	-
20.15	Maintenance supplies		(4)	-	541	90		U -38	1187	5,988	5 615				-	141		-		1-1	
2c.1	Subtotal Period 2c Adlacy Costs		-		-	14.0	*	Total	1 539	5 6O4	£!5V4		(*)	181		(**)	(-1)	::	-		-
P#00 7=	Period-Dependent Costs																				
2c.4 1	InJuninte		500	8				10 598	1 250	11.257	11 651		141	100	101		100			191	
2m;d 2	PmPl'rfy "haleft	in the	-	-	-	10.0		247	25	2:71	271		-	121				-			
Pro::k13	Health physics supplies	5	iC/s14	-		100		241	B±7	m	3 SF				-	-					- 5
2c 4 s	()rspos:iil Qf DAW g8".rall"(1		6-1110	238	200		59-9		202	2334	1214	76	-	4.04	1010032	-	1000	-	231 751	513	-
20.4.5	Plarii e 'fQ'i bijOeti	-	-	236	200		200	≤ 042	SO	5.799	5 199		154	4.0	1010032	400	-		201 (4)	213	-
2c.15	NRC Fees	5	-51	-	-	-	-	619B	6XI	1.148	711.48			350			100		5		
2:17		-	150		15	170		190	;tBS	4 :Be	2 10e	•	150	6.51	07.1	100		(5)	-	1070	-
	Indirect Overhead	-	1.81	-	550	-	i.	11199	2 580	HIM	19179	2		1.5		-	300	-	- A	2	397.257
2c. 411	S'EC:Urity \$r;a1 COIt	*	-	-	-	-		1.14F;1	2144	208	17179	*	1.5	1.5	-	-	-	-	-		317 806
2c.4.9	Unity Staff Cost	-	1 088	-	200	-	5%4	MolJi	11103	009116	69116		(=)		; cal!	-		-	281.751	513	
.0.4	SaDtotBl Psmxl 2i: Fenod-Dtl/pltrdent:Clit:lii	-	1 088	118	2000		264		11101					-	, e our	•	-	-			
2c 0	*OTAL PERIOD 2± COS!	-	3058	238	2000	-	594	435ff2	'OtOB	7., 713	77:720	-	-		14 088	*		-	281,751	513	-'ttffi3
PERIOD:	TOTALS	*	4 3 15	<b>⊹0</b>	27:3		321	1jB 379	21 (31	16529il	10fj 65S	Sy 743	888	•	15:∢7:1		-	*	389 420	709	) 665 <b>913</b> g
PERIGO	8a - Ruetti vate Sitie Following SAFSTQAI Otilfm:iPile	į																			
E\043a	Direct CorporativalOtyriu Activities																				
Jill. 1 1	Prepare Printn>nafy illicarTfTTIlliolilOn,n-J cost	4	-			-		35	6	43	43	2	120		021	121	10	101	2	-	556
TH . 2	Review plant dwgs & NpedS		140		1	150	2	1]3	10	153	15-3	2	1	949	545	920	120	020		92	1.969
3a • 1	"Itel10rm d-etulierd road surviva-									3											
32.11.4	End product description		-	-	-			22	II.	13	33	8	16	141	-	14		1-1	8	-	428
3a. 1 5	ihtarii@ed by-product frantomory	-	-		-	-	-	36		₹3	43	2			-			-	2		5'€
31.15	Define states mr\ untAncle			-	-	-		279	16	200	25(1		101	14	- 6	190		191	9	-	1002 701
3a 1.7	Perform SER and EA	-	-	-	-		-	90	* 13	HP2	103	-			0.50	100	100	0.00			33,37
la:fJ	f-B-torm Site-Specific Cov. Study	-		-		-		145	'≼'	156	10.0				-	1.0		-	-	-	2 140
38 19	Prepare/submit LICH4*lia Termination Plan				-	-		15=1	Ie	136	136		-	-	1-1	-	-	-	-	-	1753
J,i. 1 In	Receive (jilo: aQChaxai gr tetert/mill,om (Milm																				
Activity S	ecrications																				
3m7"111	Re-activate plant 4 temporary facilities	2	-					273	3.2(	2115	ZJì		25		-	-	141	-	-		1.154
	Plivit systems		141		-			Ĩ:,	16	139	125		35			-		-	-	-	1 is)
	Weactor internals		-	¥		191	2		31	236	1¥.a		10	(4)				191			319.31
	Reactor vessel	-	-		-	-	-	, ,S,	>3	216	205			190	640					(4)	2.782
Bit 1 tf II	Biological sniftld		-	2	-	-		134		P	+7		-	140	14					180	214
									lr .												1 135
3a • 11 L		2						90	1.4	204	10:		140	-	120	-		-	-	-	, 133
3a 1 11 L 3s 1 11.	Macard generators	10	-		-			90 d6	ţ <sup>f</sup>	154	10:		2:	12	141	-	-			121	16
3a + 11 L 3s 1 l'f.q 3j0111 7			-		-		-		14	11		-	2; 11			121	-				

TL(; Seetlingis, Intio

Table D-3 Oconce Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

Planning \$ Site Preparations   1.12   Prepare dismanting sequence   1.2   1.0   1.	Comm Counts Cu. Figet Cu. FMt Cu. FWt Cu, Fwet Cu. Figet W.L. LDS. Idanhouns Minch
3a 1 11 11 Waste management   90    14    16    16    17    17    17    18    18    17    18	15 159
32   11   12   12   13   13   13   13	15 159
3a 1 11 1 Waste management   190    190    193    194    193	15 159
28   4   30   11   173   124   1155   173   124   1155   173   124   1155   173   124   1155   173   124   1155   173   124   1155   173   124   1155   173   124   1155   173   124   1155   175	
Planning & Site Preparations   173   124   1151   173   124   1151   173   124   1151   173   125	5
3a   12   Perpare dismanting sequence	159
\$\frac{1}{3}\$ 1315   Plant price A temps seves   2.00   \$\frac{1}{3}\$ 1305   \$\frac{1}{3}\$ 1315   \$\frac{1}{3}\$	159
14   14   Design water clear-up system	159
Ja 1   14   Design water (clean-up system	159
Delign   D	159
Penod 3a Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   53 Addhonal Costs   54 Addhonal Costs	8 - 1 10967 9 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Pencol 3a Additional Costs  3a 2 1	8 - 1 10967 9 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
3a 2   Sine Characterization SVLep   1,528   16,28	
Equit   Equ	
Period:)a Period-Dependent CNIII    3a ± 1	
3a 4   Instrance     2f   25   306   306   308	
13.4.2   Pipperty taxes   16   17   7   7   7   7   7   7   7   7	
3a 4 J         Health physics supplies         95         475         475         475         3a 4.8         475         475         475         3a 4.7         5a 4.7	
3a.4.   Heavy equipment rental   168   98   115   518	
Apriled         Disposal of DAW generated         5         20         42         42           3a 4.6         Plant energy budget         - 1324         199         1605         1524           3a 4.7         NRC Feas         - 214         24         23         236         236           1a 4.6         Indirect Overlead         - 159         193         101         116         116	
3a.46 Plant energy budget 1324 199 1802 1522 3a.47 180 Feath 214 21 236 236 199 180 199 199 199 199 199 199 199 199 199 19	
3a 2 1 MRC Fees	
la 4 e indirect Overnead	
3.01.019 Security Staff Cost	
Ja J. 10 Unitry Start Coat	
38.4 Suptotal Period 3a Period-Dependent Car; 838 8 7 . 29 15.949 2.538 12 ).51 SWI	! 481 50p3 1 <b>8</b> 26
300 TOTAL PERUDD JAPOST . 839 8 7 . 20 24106 3949 FMQV le 770	0 - 159 - 481 Höi,J 8 W 25
PERIOO Jb. Decommissioning Prepantoons	
Firmod 30 D/test Decommissionings Activities	
Detailed Work Procedures	
3b.1.1 Plant systems 185 (B 213 192	2 21
3b.1.1.2 Reactor internals	
36113 Remaining biologs 53 B &1 H	
35.1.1.4 CRD cooling assembly	
3b. 1.1.5 CRCI housings & ICI tubes 39 E 49	
3b.1.1.6 Incore instrumentation	5
30.1.7.7. Reactor vessel	
30.1.1.8 Facility closeout 7 54 2T	
3b.1.1.9 Missile snields	
Sb.1.1.10 Biological sheld	
30 1 1 1 1 Steam generators - 'eJ 27 201 2(P	
3b.1.1.12 Reinforced concrete	
3b.1 1 13 Main Turbine	- 20
3b.1.1.14 Main Condensers	
36 1 1 1 1 5 Auxiliary building	
3b 1 1 16 Reactor building - 107 16 101 111 3b 11 Total - 1261 189 1 452 1 177	1 . 11
3b 11 Total - 1261 169 1452 517	' cd'
86 • Bubtotal Ferred 3c Astrony Coats	

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

	*					Off-Site	LLRW				NRC	Spont Fuel	Site	Processed		Burial V	olumes		Burial /		Utility and
Activity		Decon		Packaging				Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt. Lbs.	Manhours	Manhours
enod 3b	Collateral Costs																				
36.3.1	Decon equipment	883	-			(40)		* 1	132	1,016	1 016	-		-		-	100	140			
36.3.2	Pipe cutting equipment	-	1.000	-	-	-		-	150	1.150	1 150		3.45	-	140	5-0	(w)	547		191	-
30 3	Subtotal Period 3b Collateral Costs	883	1,000	÷	-	-	*	-	282	2 166	2.166	-		240	1-0	-	-	-	-	-	
Penad 3b	Period-Dependent Costs																				
3b.4.1	Decon supplies	2-	-		140	127	-	-	7	34	34	2		121	74.0	121	721	103		140	¥
	Insurance		-	0	-	14		160	16	176	176	*	120	127			-	100	2	-	2
b.4.3	Property taxes	-		¥	-	-		3.		4	4	-		-	-	-		-	- 6	-	3
tt: 4.4	Health physics supplies		203			-			51	253	253		(*)	14	-			-	*	Ε.	-
0.4.5	Heavy equipment rental	-	228		140	150			34	262	262	9			-			573		-	
b.4.6	Disposal of DAW generated	-		4	a	-	11	-	4	23	23			35	261	252	-	500	5 214	9	
36.4.7	Plant energy budget	-			150	-		-560	99	759	759			100	151	(5)		1=1			-
Ib.4.8	NRC Fees	15	-	-	18.1			107	11	118	118	1.5		1.5	(2)	(*)	1.0	-	-	100	-
b.4.9	Indirect Overhead		-	-				816	122	938	938		1.50	101	190	:::1	(*)	101			
35.4.10	Security Staff Cost		-	-				1 107	166	1.272	1.272		-	-	1-1			-		-	32 500
36,4,11	Utility Staff Cost		-	-	-		-	7.518	1.126	8.646	8 646	-						-	-	-	136,240
3b.4	Subtotal Period 3b Period-Dependent Costs	27	431	á	.3	-	11	10 370	: 537	12.484	12.484	-	1-1	2=1	251		:*:	-	5.214	- 9	168,740
3b.0	TOTAL PERIOD 36 COST	910	1.431	4	4		11	11 633	2 109	16-102	15.821		282	-	261	-			5,214	9	182 540
PERIOD 3	TOTALS	910	2 269	13	11	-	31	35 738	5 059	45 031	44.591		440		741	-		-	14 826	6 194	482 421
PERIOD 4	a - Large Component Removal																				
Period 4a	Direct Decommissioning Activities																				
Nuclear S	eam Supply System Removal																				
	Reactor Coolant Piping	28	136	16	18	120	127		102	545	545	lui.		493	483				111 944	3 930	2
	Pressurger Relief Tank	3	10	3	3	23	33		1.1	79	79			54	94	141		141	20 849	333	
	Reactor Coolant Pumps & Motors	22	69	-40	287	143	2.312	-	675	3.548	3.548		2	499	8.997				624 389	4.062	
	Pressurizer	. 6	45	324	-		7 177		341	1 894	1.894				1 847	-		-	107 604	1.796	
	Steam Generators	25	1.817	671	760		11 288		3 470	18 031	18.031			-	12.886	-		-	1 5 to 770	10 254	750
	Retired Steam Generator Units			571	750		11288		3.003	15.722	15.722			-	12.866			-	1 810 770	5.400	750
	CRDMs/ICIs/Service Structure Removal	24	. 72	235	6.2	31	134		101	560	660			374	3 053	-	-	-	75 534	2.221	-
	Reactor Vessel Internals	55	4.825	3.050	290		4 823	155	4 567	14.568	14 566			-	1.263	751	517	-	284 435	18 883	887
	Vessel & Internals GTCC Disposal			444			9.749		1.462	11.212	11.212							440	79 646	-	-
	Reactor Vessel		3 899	973	95		6.547	158	6.523	18 236	16 236				6.862	2:573		-	961.005	18 883	587
	Totals	163	7 874	6 923	2 273	313	47.369	317	201258	64 494	84 494			1 449	48 331	3.325	517	445	5 056 948	65.763	
Temoval c	f Major Equipment																				
	Main Turbine/Generator		253	175	28	765			202	1,434	1.434	2.	740	4.020			-		341.722	6.563	
4a.1.3	Main Condensers		802	91	7.4	535		-	292	1 733	1 733	-		5,310	•				238 934	20 501	*
Cascading	Costs from Clean Building Demoiston																				
	Reactor Building	- 2	710		-	8	-		106	816	815		-	141			1921		720	8,379	2
	Auxiliary Building	-	125					9	19	143	143	-	-	-	-		-	167		1 898	
	Hot Machine Shop(common)		6	-					9	7		-		-		(*)				102	9
	Interim Radwiste Building;common	1.5	72		-				3	26	26		-	- 3		(2)		-		441	-
	Radwaste Facility(common)		207					-	31	239	239	-		170		-			-	2 57.7	
	Setvice Building common)		12			-		-	2	1.4	1.4				-	100	-			226	-
a 1.46																					
	Tuttime Building	1.5	163					-	24	187	187		161			100	-		17	2.886	
44147	Tutbre Building Fuel Building		163					-	24 14	105	187			-			-			2.886 1.250	

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed			olumes		Burial!		Utility and
Activity		Decon		Packaging			Disposal	Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
Disposal	of Plant Systems																				
	Auxiliary Steam (shared)		270						40	310			310	- 0			14			8.509	
	Auxiliary Steam (shared) RCA		103		3	113			43	263	263			1.242					50.422	2 373	
	Carbon Droude (shared)		6			-			1.0	5										139	
	Carbon Dioxide (shared) RCA		12	5	2		-		5	29	29		-	131	-		-		5.337	270	
	Chemical Addition		27						d	31			31		-		-	-		821	
48158	Chemical Addition RCA		22	0		2.			13	52	52			222			-		9.016	501	
	Chilled Water (shared)		134						20	164	-		154		-		-		2.010	4.175	
	Condensate		528						79	609			609							15.699	
	Condensate / Contaminated:		526	34	7.	2 754			561	3.861	3.961		-	30 383		-			1 233 881	13 466	
	Condenser Circulating Water		338						51	389			389	1190, 20190					1 man in 1	10 040	
	Demineralized Water (shared)		134				-		20	154			154							4.267	
	Demineralized Water (shared) RCA		78	1	-	7.3			3.1	186	186			808					32 816	1 782	
	Dreset Air (snared)		43						6	49			49							1.367	
	Diesel Jacket Water (shared)		3							4		-	4		-					96	
	Diesel Lupe Oil (shared)	i i	11	2					2	13		1	13							346	
	Electro Hydraulic Turbine Control	5	18		-	-	-		3	20	- 0		20					- 1		499	
	Equipment Cooling (snared)		99	- 1		-	-		13	102	-		102	- 0		-	-		-	2.728	
	Essential Siphon Vacuum (shared)		85						13	97			97	-						2 549	
	Feedwater & Emergency Feedwater		163		-		-	- 3	24	187		-	187		- 10			-		4.862	
	Feedwater & Emergency Feedwater Cont.	- 9	148		11	443	-	- 7	106	715	715		10	4.873			-	-	197 906	3.763	
	Feedwater & Emergency Feedwater RCA	-	237	6	11	438	-		127	820	820			4 815		-	-	-	195,560	5.531	
	Filtered Water (shared)		98	0	1.1		-		15	113	620		113	4.019		-	-		190,000	2.925	
			72	1	-	89			32	196	196		314	975	-						
	Filtered Water (shared) RCA			53	97	2.767					6.123			41 409	-				39 590	1,692	
	Heatel Drains	-	1 296	24	181	2.0			909	6.123			93	41,409	-				1.681.649	32 320	
	Heater Drains (Contaminated)			-	-	-		-		93				-		-	-		-	2 239	
	Heater Vent		31		-			-	5	36			36				-			1.002	
	High Pressure Extraction		-24		-	-		-	4	27			27	-	-		-	7.60		729	
	High Pressure Service Water (shared)		101		-	-	-		15	116	-	*	116	-	-		-		-	3.016	
	Hydraulic Oil		. 2		-	-		136	0	3			3	-	-	-	-			75	
	Hydrogen	1.5	28		-	-			4	32			32	-	-	-	-			848	
	Hydrogen Seal Oil		29		-		•		4	33			33		2					899	
	Neowee Decompressing Air (shared)		ō		-			•	1	6			6	-	*	-	-			153	
	Low Pressure Extraction	-	36		•		-		. 5	41	-	4	41	-	*	-	-			1 096	
	Low Pressure Service Water (shared)		303		-	•			45	548	•	-	348	-	-	85	-	-		9.404	
	Main Steam	*	84		-		•		13	97	4.520		97	10.50	-					2.558	
	Main Steam RCA		304		65	2.530			469	3,406	3.406		-	27.868	-			-	1 129 284	7 693	
	Nitrogen (shared)		47		1.0				3	54		*	54	5.0	-					1.501	
	Nitrogen (shared) RCA	-	66		1	49			24	540	140		7/4/1	534	-	*		-	21/704	1.447	
	Periodic Testing (shared)		14					-	2	16			16	-	-					429	
	Flant Heating Steam (snared)		213	-				•	32	245	*		245	-	-				10000	6.722	
	Post Accident Monitoring	-	29	1	1	454		-	13	80	80			401		-			16 304	785	
	Reactor Building Sprily	*	88	3	5			-	52	338	339	-	in	2,105					85 488	2 150	
	Recirc Cooling Water	*	182						27	209	-	*	209	2				( = 1		5.547	
	Repro Cooling Water RCA		122	2		15			55	341	341			1.727	1500				70.146	2.887	
	Sample Monitoring		90	-		14	51		49	370	270	-		488	312				47.870	2.704	
	Second Side Cool Tritment Pond (shared)		37					(*)	- 5	43		-	43	-		-				1.708	
	Service Ar (shared)		3.9		140				- 65	45			45	-						1 254	
	Standby Shutdown Facility (shared)		27	(*)				(*)	4	7.1			31	-	-		-			641	
	Statot Coulant	(4)	49			-		-	7	56			56		-					1.507	
	Steam Oram		81		()	190			12	53			93		-		-			2.668	
	Steam Seal		48		-	÷P.		(*)	19	118	118			533	-	-	-		21.645	1.150	
	Turbine Oit		121		14.1				1.9	139	-		139	-	-		-			3.518	
	Vacuum		114		-			140	17	131		~	131	-	-					3 438	
40.15	Totals	-	6.843	1,11	65		3"		3.042	21 169	17 038		4 131	118 457	312				4 838 620	190 087	-
48.16	Scaffolding in support of decommissioning		b:"	4	19	- 5	2		178	930	930			771	48				36 988	20:107	

'fable D-3
Ocomee Nuclear Station - Unit 3
SAFSTOR Decomunissioning Cost Estimate
(thousonds 01'2008 dollmrs)

						Off-Site	LLRW			-	MRC	Spent Futd	sne-	Processed			/olumes		Burial /		Utility and
Activity	1.0.2.0.2	0.0011	ROJHO'-LIJ			Processing	Disposal	Othelt	Tottad	Total	Lie. Term.	t/Dn3gement	Restoration	Volume	Clian A		CI;)ı5aC		Processed	Craft	Contractor
Index	Activity Dosellpllon	Coat	C054	Co.Sóts	Cot;fla.	Cos14	CO-Sőb	Costs	Conling.ner	Cost>	Costs	Costs	Costa	Cu Feet	Cu Hen	Cu. Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhours
1	Subtotal PehOd 411 #Qivit/t CObb	163	1-768	.3<3	₩ £001	12.47£	<b>4</b> 1,7 439	317	24.173	111.297	107.165		4134	UDOO;	4!6S1	3 325	517	440	11.545.210	321 700	3,275
00 4.8	Collateral COtts																				
3.1	ProcKS IIIQu; ,'Il'ift,le	20	-	9	28		41		3'5	123	123		4	9	157		-	9	B 440	31	
J2	Smalllool all galrocts		221	3	(€:	1000		7.0	33	2Sfi	230		26			+	5	-	*	-	-
:U	SSul\ry and Release 0f Scrap Whital	¥		-		100	-	427;	6,1	516	514	-	÷	-			-		* .	-	1.00
3	Subtotal Pfildio 4a Collateral Costs	20	:27	9	106		<b>A</b> 1	44F	126	B92	886		25		15:7	-	*	*	9-HC	31	-
	Period-Dependent Coasts								100	4.0	100										
4.1	rJIX:on UuN:oM.	50	4.5	-	-	100			• • • • • • • • • • • • • • • • • • • •	191	e.		•	-			**	*			-
4.2	Libbarion		-	-	1.5		-	294	29		933			-			-	-			-
i1.J)	Property taxes	*		-	(=)	(*)			2.00	- 7	6		1	-	-			-		-	-
ra S	heavy equition to the second		"1"1	-	-				003	2 220	2:322 2:322		-	-	-			-		-	
III 5	Disposal of DAW generated	-	:cn	61	5.4		(15-1		12	377	id"	-	-	-	3 019		-	-	72 JHG		-
4.0				Θ,	10	3-1	3,7.3	1.154	tT)		0:07"		-	-	3 019		-	-	/2 310	132	-
1.019	Ptant energy budget				-			414	91	1327	455	-			-	-	-	-	-	-	-
4.9	Ligard Rauwash Processin J Equipment Services	-		-	1-1	-		).14	27	196	30%		-	-	-		-	-		-	-
e e	!r(Lffitt! Overhead	-	-		-		-	: \:9"	515	1 412	2.412			-	-	-	-	-	-	-	-
.a 11	Security Start Coil			-		1.0	-	. (19 ));"	,10,	2 342	2 342			-	-	-		-			58 53
4 12	cilliny Staff Cost	-		-	-				2.969	22 914	Fa'ng"4		-	-		-		-		-	J!.airk
4	Subtotal Period-4a Period-Dependent Costs	50	d 795	501			:51	1.9 125 26.277	4 12€	35.098	39.097	-			3 515				72 383	132	Ø10.136
ú	TOTAL PERIOD Ja COST	232	21:081	6.434	2 683	12 472	47.631	27 (oj:	30013	147 286	1.5] 129		4 158	130:007	52-46E	J 33:	517	4010	11,627,030	)@1 8S3	A\134C
	it) - Site OlM::OrtHMtlFultion	-	0.104	2.1.0	555	12.01.0					,, 22		77.100	120.001	22. 430	<b>3</b> .565	19.47		111000 990	7. 055	
	QUINCT Decommissioning Activities																				
11	"All""Ove spent IUtl liiK.s	1:5	IC.	'7	43	:*:	304		182	798	7901			-	1 ÇAIC				13d g1.c	601	
spesali	Plant Systems																				
z.t	Aomeany Philippent As , In, afeld	-	***	-	(*)	5.40	141	5	1	28	-		28		-	-				-:25	
122	AU).III.My Instrument Aux (shared) R"CA.		100	0	2	. 22	(4)		'0'	67	63			240	-	1-1			5.761	51e	
1.2,1	Intermition (shared)		7159	10	1-	655	141	197	-0,4	1.748	1745	-	-	7 g/7		120	-		292 273	161)1)	-
1.2.4	en fild Wall' ,I"l,rtd, RCA		"2	,	3	129	141	-	47	290	:.lC			1.379			-	-	35.916	Zf05	
12:5	":-IWTpotTm-1 COoOklg	-	J.		140		140	-	7	50	-	~	54		-			1-	0.5	2.374	
1.2,:	CamDOOer, I Coolin; RCA		116	2	2	130	-		#10	300	300		12	1 430	-	-	141	12	511079	2 67.1	
12.7	Compressed #1 15ng/eJ:		31	-	(4)	-			5	1116	61		44	-	12	-				t :::=f}	19
), o2.j	CO:!'O"Fund}A 'j'uh44Uj RCA		368	B	Ð	223			'01	603	W:3	-		2.455	-	-		-	S'168!	60-1)	
129	Care Fio-oo	-	97	3	,	192		•	54	351	351			2.110	-	-	-		8,56.	2 358	*
1 2 10	6eletncai (": 'Jean!		1-045		-	•		-	OC:a	1:201			1.201		-	-				29,289	8
	E/ect/HQH COntiUP#fatt/(Y.j	*	210	J		187	10	(2)	B4	495	488		-	15I!B	53			(25)	HI SO,	fi 1.2 <sup>11</sup>	
1.2.12	Electrical (Contaminated) RC6	-	1.481	26	.15	t 735		-	e,40	1.926	3,926	4		15009	-		18		77439,	)5.254	-
	filiPJ Od Iitla;oaj		53		-	-	100		J	61	* 1		61		-	101			-	1.583	
1112;14	Fuel Oil •shipetil RCA		12	0	Ü	tU		- 1	5	ZT	2:		100	111	-			100	4,488	: <n< td=""><td></td></n<>	
	Gaseous Waste Disposal		31-	34	31	f14.8	zr		179	944	944			1'5Jlio	1.267		100	200	175 125	15Ji!	
1.2.16	4-III Pressultt 1,,eo,:11Q.	-	TigiT	17(1)	155	2 3 1 3	F45	-	180	4.885	4 \$85			25 429	300112				1374 3&4	19 605	
	HQ1 Pressure Service Wolfest (shared) RCA	-	921	20	33	1 375	-	-0	444	2.796	2 j96	-		; 119	-	-	-	-	611 994	21 405	-
	incore Ir,ttlluff-Enr Piping	-	15	II.	Ω	-	1		- 0	22	22				13		141		1 168	400	-
	Instrument Air (shared)		5]			-	*		114	107			107	-	-	(8)	1.0		-	2 !JS	
	Instrument Air (shared) RCA		145	3	3	'ff.i	*		62	379	)'i			1 B22	100	191	100	0.00	73.998	J 447	-
1.2.21	L#adl7hdRiFireHt11.HneedU	-	06		-					e,	1		64	¥		191	190	( 🐷	-	1.678	
	Liquid Williato (S"lilerji	-	1 %SA	90	115	411	M,	-	OJ	£ 022	2.922	-	-	4.513	1.8.(E	12	141		523 26.4	25 232	
	Lqwd Waste Olipoliti	2	1.346	110	135	501		-	6&1	3611	36"	-	-	5,503	4,61C		14		616.89;	THE STREET	-
1.22J	Low Pressure Injection	2	"Yi	3/6	54	. 0	250		30H	1.850	HSO	-		.2eo	3.294	-	-		olSoOi9(1	1: :00	-
1.22J 14.2.24			'Yi t ltD)	35 10	51 55	:,9,	250		MY	1.850 11.4all 198	4 0j;:1		-	25228	1.114				6ISoOi9(1 1 024 SA')	32,015	-

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	olumes		Burial /		Utility ar
Activity		Decon		Packaging			Disposal	Other	Total	Total	Lic. Term.	Management		Volume	Class A	Class B	Class C	GTCC	Processed	Craft	Contract
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu_Feet	Cu. Feet	Cu. Feet	Wt., Lbs.	Manhours	Manhou
	Plant Systems (continued)																				
	Plant Drinking Water (shared)	-	131	-				*	20	151	1.5		151		3-		8			4.204	
	Plant Heating Steam Ishared; RCA		108	1		91			41	245	- 245			1 005	-				40 799	2,472	
1.2.29		-	145	7	11	440	-		106	712	712	170		4.842	-	-			196.641	3.591	
	RFS Refueling Water	-	40	1		51		1.0	18	111	111	(*)	*	562		-	-		22 826	929	
	Radiation Instrument Alarm		11				-		2	13		100	13	*	-		~		10.500	323	
	Radiation Instrument Alarm RCA		29	0	9	6				42	42		-	63		-	-		2.565	788	
	Reactor Building Cooling		345	25	44	1 705			351	2.471	2.475			18 745	-	-	-		761.247	5 761	
	Reactor Coolant	-	206	18:		66	108		93	508	508		-	723	553				78 866	5.353	
	Reactor Coolant Storage		440		54	350	319	-	254	1.457	1.457	-	-	3.848	1.804				302 444	10.018	
	Reactor Coolant Treatment (shared)		135 478	13 45	65	65 336	64	-	68 284	1607	1607			709	462		-		67 419	3,205	
	Resin Recovery (shared)	-	70	40			398	-		80		-	-	3,720.	2,170	-	-		333,418	11.897	
	Sanitary Waste (shared)	-				1600	-		10		76	-	80	220	-4	-	-		40.004	2,135	
	Sanitary Waste (shared) RCA	-	33	11	1	.29	-	-	13	75	167	-		320		-	-		12 994	765	
	Service Air (shared) RCA Solidification (shared)	-	836	88	111	80 405	794		28 474	2 628	2.628		-	662 4.455	3.724		-		25.884	1.633	
			448	34	54	509	291		273	1 609	1 509			5.595	1.503		-		506 293 360 682	20 176 11 130	
	Spent Fuel Cooling Vehicle Fuel		9	34	-544	303	291		470	11	1 502		11	2.285	1.003					303	
	Ventilation (clean)	- 0	169				•		28	217			217				-	- 6		5.848	
	Ventilation (clean) RCA	-	182	4		336			98	529	629		211	3.694					150,000	3 454	
	Ventilation (contaminated)	-	519	16	25	809	. 51		270	1 693	1 693		-	8.891	262	-	-	- 5	384.549	11,565	
	Totals		15 361	780	1.105	16.497	4.811		7 575	46,528	43,991		2.138	181 346	25 455		-		9.571.634	376.290	
													4.190				-				
13	Scaffolding in support of decommissioning	*	971	21	5	117	1.4	*	267	1,394	1 394	•	-	1,156	72	-		-	58 482	30 161	
	nation of Site Buildings																				
	Reactor Building	675	567	171	254	424	947	-	038	3,998	3.998	1.0		4 658	10.211		-		894,565	31 331	
	Auxiliary Building	314	105	.29	42	64	60		217	831	831			707	1.637	-	-		141 352	10 135	
	Contaminated Mrsc. Structures(common)	13	3	7	2		2		5	30	30	-		-	EG		-		4.735	394	
	Hot Machine Shop(common)	44	19	4	- 6	17	9		39	132	132			187	237		-		23 857	1,498	
	Intenm Ragwaste Building(common)	89	28		172	15	17		61	230	230			189	473				39 310	2.535	
	Radwaste Facility/common(	320	226	36	39	217	57.		272	1,157	1.157		-	2.386	1.362				190.675	12.919	
	Retired Steam Gen Storage Fac (common)	74		5	- 5	2	2		40	127	127		-	18	5.3		-		5.089	2 060	
	Turbine Building	197	21		8	118	15		108	349	349			- 5	314	-			21.708	5.530	
	Fuel Building Totals	1952	1 327	25 t	371	857	1118		199	7.673	818 7.673			1 293 9 418	168 14.533		-		1 385 417	71 315 78 017	
	· utars								1231			•		3.4(0	19:533		•	,	1.180.411	14.01	
1	Subtotal Penod 4b Activity Cuets	2.12	12.679	1.128	1 524	17.470	6.245		0.821	55 994	53 856		2 138	191 920	41.500		*		11 153 810	485 069	
	Additional Costs																				
	Containment Paint Remediation	93	7	7	12		84		69	264	264	-			452					800	
	License Termination Survey Management Program	-			-		100	618	185	801	801	100		181	•					*	
2.3	ISFSI License Termination Subtotal Period 4b Additional Costs	92	2 396 2 395	19	103		1 628	1 868	1.462	6,586	1.065	6.585 6.585		-	9 342 9 794				1 815 475	47,56.3 48 36.3	
		74	7.00																		
	Collateral Costs Process liquid waste	57		27	90		118		73	355	355			_	495				27.270	89	
3.2	Small thoi allowance	21	366	- 21	24		110		55	420	420		-	-	493				61.274	11.5	
	Becommissioning Equipment Disposition		300	109	26		73		124	840	940		-	5.000	373		-		303 501	88	
134	Survey and Release of Scrap Metal			109		. 1000	- 2	670		771	771		-	5.000	2(2				202.201	99	
3	Suntotal Period 4b Collateral Costs	57	366	135	100	606	191	670	752	2.486	2.486	-	-	6 000	828		-		330 771	177	
riod 4b	Period-Dependent Costs																				
141	Decon supplies	1.142			-	u u			285	1.428	1.428		141	(4)							
642	Insurance					2	2	573		629	629			121	-	120					
	Property taxes							17		13	13				~			*	1.0		

Table D-3 Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

Section   Decomposition   De							Off-Site	LLRW				NRC	Spent Fuel	Site	Processed	_	Buriel	/olumes		Burial /		Utility and
1.65   New you sugment rental   3.96	Activity Index						Processing	Disposal				Lic. Term.	Management	Restoration	Volume		Class B	Class C		Processed		Contractor
1.00   1.00	Period 4b	Petrod-Dependent Costs (continued)																				
177   200   2006   20	45.4.5		3-1	3 896	181				-	584	4.480	4.480	(6)			2.1			-		-	15
14.5   16.7   16.5	45.4.€			2.5	120	101	-	300	*	102	623	623				7,311	-		-	142.210	259	100
Fig.   Fig.   100   10	45.47		190		-	-	-		1,771	266	2 036	2.036		-		-	-		-	-		18
14   Series Commons     387   984   4466   4469	4b.4.8		140	· ·	191	-		-	E04	80	884	884		-		-	-	-	-	3-6	-	1-1
2-819   1841   5441   5	4b.4.9	Liquid Radwaste Processing Equipment/Services	190		140		-	~	569	100	769	769		-	-	-			-	-	-	191
### 2   1   1   1   1   1   2   2   2   2	46.4.10		100	· ·	190	-	-	2	3 875	581	4 456	4 456	120		-	-	-		-	(4)	=	
A Biologial Remode du Personal Department Coars	40.4 11	Security Staff Cost	121	-	191	-	-	-	3 958	594	4 552	4 552	(4)	-				-	-	-	-	116,250
TOTAL PERIOD ALL COST 3 41E 27 385 1 423 1 837 1 6075 3 441 5 1299 20 500 102 434 1 12711 6 585 2 138 107 502 59 333 103 402 270 533 506 772 2 533 506 772 503 506 772 503 506 7 500 102 500 1	ab 4 12	Utility Staff Cost					*		37.062	5 559	42 521	42 621		-	-		-	2	-			647 280
### Description   Part    46.4	Subtotal Period-4b Period-Dependent Costs	1.142	6 946	120	101	-	300	48.721	9 973	66 304	66 304		-	-	7/111		-	20	142 210	259	763 530	
### ### ### ### ### ### ### ### ### ##	4b.0	TOTAL PERIOD 46 COST	3.416	27.385	1 404	1.837	18 075	5.447	51.259	20 609	132 434	123.711	6.585	2.138	197 920	59 333		÷	*	13,442,270	533.868	772.330
11 OKRE Cuntimatury survey	PERIOD 4	4e - License Termination																				
1.12   Sential Period 44 Solity Cols   100 44 1185 196																						
11 Susticial Privile de Astroyi Costs					-	-		1	120	45		195	(*)		-			-		18.3	=	-
read 44 Associat Costs   121   Lecense Fernindens Survey   5 845   2055 8 904 8 904   171 046 3 1										Jugo.		335										
23   Luciens Termination Survey   \$849   2055   8904   8904   771 086   27	Ae 1	Subtotal Period 4e Activity Costs	100	-	1.00	-	-	•	150	45	195	196			-		-		-	*	-	-
### 2055 8-904 8-904																						
### Proper   Section   Sec			-	-	-	-	-	-						-	-	-			-			3 120
Not price	46.2	Subtotal Period 4e Additional Costs	-	-			-	-	5 849	2 055	8.904	8.904			-	-	-	-		-	171 046	3 120
Property taxes		Period-Dependent Costs																				
Health progress supplies	te,4 1	Insurance		*				2	2	-		-			20		-	-	=		-	1-1
1.64   Diaposal of DAM generated   5   5   5   6   30   30   344   6882   13     2.45   Plant enterpty budget   199   30   228   229   144   144     4.77   Indirect Overhead   2.75   109   835   835   127   847     4.87   Plant enterpty budget   2.75   109   835   835   127   847     4.88   Security Staff Cost   706   106   815   815   127   127     4.9 Utahly Staff Cost   708   127   717   877   127   127   127   127   127     4.9 Utahly Staff Cost   708   127   717   877   127   127   127   127     4.9 Utahly Staff Cost   1003   6   5   15   8572   1674   12274   12274   344   6882   13   1401     4.9 Utahly Staff Cost   1003   6   5   15   8572   1674   12274   12274   344   6882   13   1401     4.0 TOTAL PERIOD 4e COST   1003   6   5   15   6571   3773   21372   21372   344   6882   17   6882   17   6882     4.0 TOTAL PERIOD 4e COST   1003   6   5   15   6571   3773   21372   21372   344   6882   17   6882   17   6882     4.0 TOTAL PERIOD 5e - Site Restoration   1005   1005   1005   1005   1005   1005   1005     4.0 TOTAL PERIOD 5e - Site Restoration   11   1005   1005   1005   1005   1005   1005   1005   1005   1005   1005     4.0 TOTAL PERIOD 5e - Site Restoration   11   1005   1	e42	Property taxes				-	-		5				1.0	-	-	-	-	-	iii.	-	-	-
Flat Plant entrip budger   198   30   228   229	e.4.3		-	1.003		=	8	-	-				-	9	21			9	8		-	12
NRC Feer	le 4.4	Disposal of DAW generated	100		5	5	-	15	-		30				-	344	-	-	-	6.882	13	-
Indicated Coverheads	de 4.5	Plant energy budget				-	-	(2)							-	-	-	9		-	-	-
187   186   186   187	4e.4.6			-	170	-	-	(5)						*	-	•		-		, <del>-</del>		-
Unitry Start Cust	4e 4.7		(*)		(8)	-	-	570						-					-		2	
ERIOD 4 TOTAL PERIOD 4e COST	4e.4.8		161	-	(0)	-	=	0-1								-						18.789
ERIOD 4 TOTAL PERIOD 4e COST			-	-	1-7	-		100					181	-	-				-			121 343
ERIOD 4 TOTALS 3 50 50.172 7.843 4.525 30.546 56.95 94.865 53.396 30.1093 288.212 6.585 6.295 327.927 112.144 3.325 517 440 25.076.180 1.026.789 1.328.89  ERIOD 56 - Site Restoration  enod 5b Direct Decommissioning Activities  emolition of Remaining Site Buildings	4e 4	Subtotal Period 4e Period-Dependent Costs	*	1 003	6	5	*	15	9 572	1,674	12,274	12.274		*	(4)	344			-	6,882	13	149,131
ERIOD 56 - Site Restoration  enod 5b Direct Decommissioning Activities  emolition of Remaining Site Buildings  21.1.1 Reactor Building 21.1.2 Administration Building (common) 21.1.2 Administration Building (common) 21.1.3 Administration Building (common) 21.1.4 Clear Miss. Site Structures (common) 21.1.5 Candenser Discharge Structures (common) 21.1.6 Confamilated Miss. Site Structure (common) 21.1.6 Confamilated Miss. Site Structure (common) 21.1.6 Confamilated Miss. Site Structure (common) 21.1.6 Confamilated Miss. Site Structure (common) 21.1.6 Confamilated Miss. Situture (common) 21.1.6 Confamilated Miss. Situture (common) 22.1 Administration Building (common) 23.1 Administration Building (common) 24.1 Administration Building (common) 25.1 Administration Building (common) 26.1 Administration Building (common) 27.1 Administration Building (common) 28.1 Administration Building (common) 29.1 Administration Building (common) 29.1 Administration Building (common) 20.1 A	4e.0	TOTAL PERIOD 4e COST		± 003	.6	-5	-	15	16.571	3.773	21.372	21.372				344			-	6.862	171 059	143.251
emolibori of Remaining Site Buildings  11.1.1 Reactor Building 4.114 4.731 4.731 4.731 53.465  11.1.2 Administration Buildings 1.12 53.465  11.1.3 Administration Building (common) 1.7 5.339  11.1.4 Clean Miss. Sets Structures (common) 5.931 58. 1.289 1.289 1.7079  11.1.4 Clean Miss. Sets Structures (common) 5.931 58. 1.289 5.210  11.1.5 Condenser Discharge Structure (common) 298 521 6.521 53.210  11.1.6 Contaminated Miss. Sets Structure (common) 298 4.54 342 342 2.541  11.1.6 Contaminated Miss. Structure (common) 1.46 2.2 1.68 1.68 3.64  11.1.7 Contract Services Building (common) 1.46 3.048 3.604  11.1.8 Essential Sphon Vacuum Bidg (common) 3.04 4.34 3.604  1.1.9 Hist Machine Shopt common 3.33.5 5.00 3.836 3.836 4.938  11.1.1 Intern Baraviste Building (common) 4.46 5.938 3.936 3.836 3.836 3.936	ERIOD 4	TOTALS	3 650	50.172	7.843	4.525	30.546	56 395	94 865	\$3.398	301 093	288.212	6.585	6,295	327.927	112 144	3.325	517	440	25 076 190	1 026 789	1 328 992
emolition of Remaining Site Buildings  1.1.1 Reactor Building  4.114 53.465  1.1.2 Administration Building(common)  1.17 1.5 1.5 1.5 1.5 1.5 1.5 1.7079  1.1.14 Clean Miss. See Structures (common)  1.1.15 Cundenser Discharge Structures (common)  2.98 2.5.91  1.1.5 Condenser Discharge Structure (common)  2.98 2.5.91  1.1.6 Contaminated Miss. Structure (common)  2.98 2.5.91  1.1.6 Contaminated Miss. Structure (common)  2.99 2.5.91  1.1.15 Contract Services Building (common)  2.90 3.24  2.5.91  1.1.16 Contract Services Building (common)  3.0 4.57  3.18 2.58 2.59  3.19 3.504  3.19 3.50  3.10	ERIOD 5	5b - Site Restoration																				
	Period 5b	Direct Decommissioning Activities																				
1.1.2     Addresstation Budding (common)     117     18     135     2,339       1.1.3     Auxiliary Bulding     1.2     1.88     1.289     1.289     1.289     1.7079       1.1.4     Clean Miss. Sets Structuries (common)     5,931     88.21     6.821     6.821     6.821     6.821       1.1.5     Confamiliated Miss. Structuries (common)     298     45     342     342     24     24       1.1.6     Confamiliated Miss. Structuries (structuries (common))     20     3     24     22     467       1.1.6     Confard Services Bulding (common)     146     22     168     168     3.048       1.1.6     Essential Sphon Vacuum Bidg (common)     30     4     34     34     36       1.1.9     Hit Machine Shop(common)     30     4     34     34     36       1.1.9     Hit Machine Structuric (common)     33.35     36     3,336     45,038       1.1.11     Interm Radvaste Bulding(common)     44     36     49,038       1.1.11     Interm Radvaste Bulding(common)     46     67     513     50	Demoktor	of Remaining Site Buildings																				
1.1.1   Auxiliary Buldring					-	5	-	17	-				-				-		-			-
11.4   Clean Misc See Structures (common)   5,931   890   8,821   6,							-	62				-	-		-	-	9		-	-		
1.1.5   Condenser Discharge Structure(common)   298   45   342   342   2541							-	15				-					7					-
0.1.1.5     Contraminated Misc. Structures, common)     20     3     24     24     34       1.1.7     Contract Services Building (common)     146     22     168     168     3.048       1.1.6     Essential Syphon Vacuum Bidg (common)     30     4     34     34     34       1.1.19     Hat Machine Shop(common)     108     16     124     124     124     1935       1.1.10     Intake Structure/common     3.335     500     3.836     3.836     45.036       1.1.11     Interim Radvaste Building(common)     446     67     513     513     9.013			-			-	*												-	100		-
1.1.7 Contract Services Building(common)     146     22 168     158     3.048       1.1.8 Essential Siphini Vacuum Bidg (common)     30     4 34     34     34       1.1.9 Hot Machine Ship(common)     108     16 124     124     1935       1.1.10 Intake Structure(common)     3 325     500     3 836     3 836     45 038       1.1.11 Interm Radvastee Building(common)     446     67     513     513     49 013						-	-	15.					100		-							170
2.1.1.8   Essential Sphon Vacuum Bidg (common)   30						-		1.0		49		4.5	1-1		-		-	===				1.0
1.1.9   Hat Machine Shoptcommon    108   16 124   124   1.935   1.93			-		-	-	-	(5)	(*)			(10)	(*)		(*)			-				
11 10 Intake Structure (common 3 3.35 5.0 3.836 3.836 45.036 - 21.11 Interim Radwaste Building (common 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1					5-3	-	-	161				-	100						-			
2.1.1.1 Interim Radwaste Building (common) - 446			100		140		-	>	-						-		*					-
					7-1	-	-					2-1	5-0			-			-	:-:		
11.1.12 Maintenance Support Building (common) 130 20 150 150			-		(-1	-	-		-			1-	3-1		-	-		-	-			-
	5p 1 1 12	Maintenance Support Building(common)	-	130	(-0)	ž.	-	(-)	(-)	20	150	2-1	(*)	150				-	-	:•:	2.583	-

Table D-3 Oconce Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

						Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial V	olumes		Burial /		Utility and
Activity		Decon	Removal	Packaging	Transport		Disposal	Other	Total	Total	Lic. Term.	Management	Restoration	Volume	Class A	Class B		GTCC	Processed	Craft	Contractor
Index	Activity Description	Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet				Cu. Feet	Wt Lbs		Manhours
Demolitio	n of Remaining Site Buildings (continued)																				
	Miscellaneous Site Foundations(common)	-	736			180	-		110	846		-	846	-		-		14.		9 686	
5b:1.1.14	Radwaste Escility(common)		1.887				-		280	2:147	5.00		2.147	-	-	-	-			23 191	
5b 1 1 15	Retired Steam Gen Storage Fac (common)		655			190	-		98	754			754	-						11 110	-
	Service Building(common)	7.5	281	140		(*)	5-1		42	323		-	323		-		-			6.113	
5b.1.1.17	Standby Shutdown Facility/common	*	492	1.0	-				7.4	566		-	566				-			5 350	
5b 1.1.18	Switchgear Enclosure(common)		113	3.5		143			17	129	(4)	-	129		~				-	1.911	
50 1 1 19	Switchgear House common		57		-	1-	(-)		9	85			66		2	12				819	
5b 1 1 20	Technical Support Building common)		49	-	-	-	100		.7.	56			56							1 034	
5b 1121	Turbine Building		1.581	-	:2	(-)	141		237	1.818			1 818				4		-	28 771	- 4
56.1.1.22	Turbine Pedestal		415			14	(4)		62	478	-		478		-	4	-		-	5 015	2
	Fuel Building		869		2	12	12		130	999			999				-			12.284	
5b.1.1	Totals		22,913		-	(4)	-		3.437	26.349			26.349	÷ .	-	*		*	*	328 003	
Site Class	eout Activities																				
5b.1.2	Backfill Site		2.266		9				340	2,605	-	-	2.606		-	2		7	-	8 357	
56.13	Grade & landscape site		119					100	1.8	137	-		137	9	-		2	2	2	289	
5b:14	Final report to NRC			-				61	.9	70	70	9							-		568
5b.1	Subtotal Period 5b Activity Costs		25 29T	17				0.1	3.804	29 162	70		29 092					-		336 549	568
Period 50	Additional Costs																				
5021	Concrete Crushing		819	1.5		1.00	145	9	124	947		-	947				-			4,168	
5h.22	ISFSI Demokton and Restoration		990			1.5	0.00	3.0	154	1.163		1.183	-	-			-			7.678	160
56.2	Subtotal Period Sb Additional Costs		1.809					-44	278	2.130		1 183	947			~		-		11.846	160
Period St	Collateral Costs																				
5b 3.1	Small tool allowance		248				-		37	285			285							-	
5b.3	Subtotal Period 5b Collateral Costs		248		-				37	285	-	140	285	-		-	-	-			-
	Pency-Dependent Costs																				
50 A 1	Insurance			181		-	-				-	-		-	-			-			
5b 4 2	Properly taxes					2		15	2	1.7		-	17	-	-			8			
5n 4 3	Heavy equipment rental		6.792			2		*	1.019	T-811		*	T.811	-	-	8		8		*	
5h 44	Plant energy budget				-	-		307	46	353			353		-			3			
5b-4 5	Indirect Overhead	4	-				8	1.463	219	1 683	1.683					*	-		-		
5b 4 5	Security Staff Cost				-		*	2 190	329	2.519	-	-	2.519		-	-			-		58 08
5b 4 7	Utility Staff Cost		•		-	-		14.948	2.242	17 190	-		17 190	-			-	×			744.42
5b a	Subtotal Period Sb Period-Dependent Soste		6.793		-	÷		18 924	3 857	29 572	1 583		27.689			-		-			302 500
3b D	TOTAL PERIOD 56 COST		34 146		-	-		18 029	1 975	61 150	1753	1 163	58.214				-			345 435	303 328
PERIOD	5 TOTALS	18	34 146					19 029	7 975	61 150	1.753	1.183	58 214	1	-					348 495	303 328
TOTAL C	COST TO DECOMMISSION	8.852	P5 553	8.216	5.410	30.561	59.604	345 014	100 478	653 737	518 504	68 473	66.760	328 047	160 922	3 325	517	440	25 947 360	1 491 133	4 569 645

## Table D-3

## Oconee Nuclear Station - Unit 3 SAFSTOR Decommissioning Cost Estimate (thousands of 2008 dollars)

					Off-Site	LLRW				NRC	Spent Fuel	Site	Processed		Burial \	/olumes		Burial /	L.	Utility and
Activity								Total												
Index Activit	ty Description Cost	Cost	Costs	Costs	Costs	Costs	Costs	Contingency	Costs	Costs	Costs	Costs	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Cu. Feet	Wt. Lbs.	Manhours	Manhours

TOTAL COST TO DECOMMISSION WITH 18.16% CONTINGENCY:	\$653,737	thousands of	2008	dollars
TOTAL NRC LICENSE TERMINATION COST IS 79,31% OR:	\$518,504	thousands of	2008	dollars
PENT FUEL MANAGEMENT COST IS 10.47% OR:	\$68,473	thousands of	2008	dollars
ION-NUCLEAR DEMOLITION COST IS 10.21% OR	\$66.760	thousands of	2008	dollars
OTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC)	164,762	cubic feet		
OTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	440	cubic feet		
OTAL SCRAP METAL REMOVED:	66,351	tons		
TOTAL CRAFT LABOR REQUIREMENTS:	1,482,966	man-hours		

End Notes 
n'a - indicates that this activity not charged as decommissioning expense 
a - indicates that this activity performed by decommissioning staff 
0 - indicates that this value is less than 0.5 but is non-zero 
a cell containing - " indicates a zero value."